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# The Journal of Speech and Hearing Disorders

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# The Journal of Speech and Hearing Disorders

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## FORMAL CALL FOR PAPERS

### Twenty-Fifth Annual Conference of the American Speech and Hearing Association

CHICAGO, ILLINOIS DECEMBER 28-30, 1949

The Program Committee will continue to receive for examination until October 1, abstracts of papers and addresses proposed for a place on the program of the 1949 meeting of the Association. Four general types of material will be considered:

1. Theoretical or experimental papers on speech or hearing disorders.
2. Practical papers on techniques for the rehabilitation of speech or hearing disorders.
3. College, Medical School and University resident and non-resident diagnostic and remedial programs for speech or hearing disorders.
4. National, state, or city programs for the rehabilitation of speech or hearing disorders.

The Committee will operate under the rules set down in the Constitution of the Association.

All abstracts must be received by the Committee by October 1, 1949. In addition to summarizing the paper, each abstract must indicate (a) the time required for presentation, (b) details on the type of visual or audio aids which will be needed, and (c) other requirements. The full name of the professional affiliation of the author should be indicated.

Receipt of an abstract will be taken as evidence that the person submitting it is aware of the following rules governing the conduct of section meetings:

1. All meetings will begin when scheduled.
2. Chairmen will, without exception, hold speakers to time limits as they are set forth in the Program.

The Committee will welcome suggestions from members regarding non-members who can contribute significantly to the program. Such recommendations are to be transmitted to the Committee through a Fellow of the Association.

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*JOURNAL OF SPEECH AND HEARING DISORDERS*, 1949, **14**, 98-103

# The Relationship between Clinical Psychology and Audiology

Helmer R. Myklebust*

AUDIOLOGY has been defined as the science of hearing (**3**). Within the area of the science of hearing are several specific fields. Audiology perhaps is existent as we know it today chiefly because of medicine, physics and speech pathology. In order for audiology to mature and to become in actuality a science of hearing, it seems necessary that it be influenced more by the fields of special education, psychiatry and clinical psychology. Only through the unified emphasis of these fields can a real attack be made upon the problem of psychological evaluation and educational classification. It is the major purpose of this paper to emphasize that clinical psychology has an important contribution to make in audiology. First, because there is a basic relationship between the problems encountered. Second, because a certain body of knowledge exists in clinical psychology relative to children and adults with impaired hearing which should be applied more effectively in the practice of audiology. Third, because there are clinical and research problems in the general area of psychological evaluation which are in urgent need of mutual investigation by clinical psychology and audiology.

## The Emphasis of Audiology and Clinical Psychology

Audiology, with its overall multiphasic approach, is bringing new emphasis to the concept which maintains that to deal effectively with the individual it is necessary to consider the whole person. Audiology makes the assertion that it is not enough to view the person only from the point of view of illness, or only from the point of view of amplification, or only from the point of view of communication. Audiology maintains, rather, that all relative disciplines be applied, not as separate units but as an integrated, working whole. This position assumes realistically, that this is the only approach which is justified when the *individual* is to be dealt with and not just the *hearing loss*.

Clinical psychology can claim small fame for its work in audiology. In general, clinical psychology has been rather far removed from individuals with physical handicaps. It has made noteworthy contributions to the area of working with mental handicaps. Like audiology, however, clinical psychology has maintained that a multiphasic, all-inclusive approach is essential in dealing adequately with people. Clinical psychology historically has been concerned with bringing about maximum self-expression on the part of the individual. Like audiology, it is first and foremost concerned with individuals and not with groups. It captializes those scientific techniques which add to our understanding of a particular person.

Many more similarities between audiology and clinical psychology could be given. The point, however, has been sufficiently emphasized. There is a definite and specific relationship between the approaches of audiology

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and clinical psychology. The emphasis of clinical psychology would add generally to the field of audiology and to the effectiveness of the audiologist.

### The Body of Knowledge in Clinical Psychology

A body of knowledge has been accumulated by clinical psychologists which should be a part of the science of audiology. For example, clinical psychology for many years has been concerned with adequate techniques for the determination of the mental competence of individuals who, because of hearing impairment, have inferior ability to communicate. In this connection much credit must be given to the pioneer work of Rudolph Pintner (**14**). All of the questions have not been answered regarding the diagnosis of mental ability of children and adults with impaired hearing. There is, however, much information available and the audiologists who are overlooking this work are disregarding many years of research and accumulated experience which is of considerable importance. It is possible at the present time to determine adequately the mental level of deaf and hard-of-hearing children and adults, even though they have little or no ability to communicate in the usual sense (**10**).

Clinical psychologists have been at work on other problems presented by individuals with impaired hearing. Tentative standardizations have been made of certain mechanical aptitude tests for deaf boys (**12, 15**). Several tests of motor abilities are available and are being used diagnostically (**8, 9**). These tests have considerable suggestion relative to the determination of central versus peripheral lesions and they reveal pertinent information pertaining to etiology in general (**11**). Studies of the psycho-social adjustments have been made which clarify some of the issues regarding the personal and social problems of the deaf and hard-of-hearing individuals (**2**). These studies indicate that it is in the area of social competence that the handicap of deafness is primarily revealed (**13**). Clinical psychologists have assisted other specialists in determining levels of successful use of hearing aids. Several studies have been made on the effect of hearing loss on personality (**5, 6, 13**). Investigations have been made regarding the relationship of hearing loss with educational achievement and speech development (**7, 14**).

One of the urgent needs is that of incorporating this background of methodology, knowledge and experience into present audiological services. This accumulation of information and experience is not being used with much effectiveness at the present time.

### Clinical Diagnosis and Research

Another consideration is the need for more standardized procedures and systematic research. There are urgent clinical and research problems in the field of audiology which are essentially psychological in nature. One of these is psychogenic deafness. There is experiential evidence which suggests that this area has been over-worked. Experience in the military clinic, as compared to the civilian clinic, seems to represent selected psychologic factors in this connection. Definition is inadequate, furthermore, and research is lacking. Perhaps clarification would be fostered if it were agreed that true psychogenic deafness included only those individuals who are unaware of their own delusion. This classification has been used historically. True psychogenic deafness in the past usually has referred to that individual who through delusion behaved as though he had a hearing loss, although he had normal hearing acuity (**1**). Another form of psychogenic disturbance is that which has been called psychogenic overlay. Currently, this refers to the individual who has a hearing loss of a certain degree but behaves as though the loss is more

severe. This person is more handicapped than his particular loss of hearing would warrant.

There is a third type of psychogenic disturbance which to date has received almost no attention on the part of audiologists. This is the individual who has a hearing loss but behaves as though he has normal hearing. This problem is the opposite of that considered under psychogenic overlay. By contrast this condition is that of minimizing or concealing the hearing loss and behaving as though hearing is normal or near normal. In reality there is a hearing loss. This type of psychogenic disturbance might be called *psychogenic underlay.*

In clinical evaluations it is essential to be extremely cautious and guard against confusing true psychogenic deafness with other clinical types which at the present time are not well understood. Such confusion might partially be avoided by adhering to the classification that in all true psychogenic disturbances the subject is not aware of his delusions. By implication, malingering is not psychogenic deafness, although it is a related type of behavior. Likewise, the individual who simply finds it difficult to accept his hearing loss is not a true psychogenic. This common phenomena of resistance, however, is an important problem in clinical audiology and it must be dealt with on more than a superficial basis. Some of these individuals, who find acceptance of the hearing loss difficult, do become true psychogenic cases.

At present it is difficult to secure adequate treatment of psychogenically deaf individuals. This is not because the problem of psychogenic deafness is new. It has been recognized for many years but it has recently taken on new emphasis and therefore there is need for new definition and exploration. This is an area in which clinical psychology and audiology can profit greatly from mutual planning of research.

Better diagnosis of functional deafness in children is extremely urgent. In children a distinction is made between hysterical deafness, which is comparable to psychogenic deafness in adulthood, and psychic deafness (4). Although psychic deafness is thought to be rare, it is this type which is readily confused with true deafness or with aphasia. These children can be adequately differentiated in most cases from the child with true hearing loss on the basis of behavioral symptomatology. As a frame of reference clinically, it is necessary to be aware of the characteristic symptomatology of the child with true hearing impairment.

Some of the differentiating characteristics of the child with a true hearing loss might be given as follows: (1) The child does not improvise sound; he does not engage in humming or whistling for his pleasure. This does not mean that the deaf infant does not babble. (2) There is little laughing and the sound of the laughter is not typical in quality to that of the hearing child. (3) The gait of the deaf child is characteristic. In general, such children drag or shuffle their feet as they walk. This is apparent in watching groups of deaf children in schools for the deaf. (4) Vocalizations are often loud and atypical in quality. (5) There is poor social rapport; there is much preoccupation with objects and things and little contact in a give-and-take manner with people, often including the parents. (6) There is constant attention to movement; even slight movements are distracting and will cause the deaf child to turn and look. He is constantly following with his eyes. (7) There is an appearance of confusion and blankness which, while difficult to describe and contrast with other types of handicapped children, is helpful in corroborating other symptomatology. In general, the hearing impaired child is hyperactive, poorly disciplined, and socially immature. Social immaturity refers to

retardation in ability to dress himself, feed himself, etc.

In contrast, the child with psychic deafness has a history which reveals that he has been considered primarily a behavior problem rather than a problem because of hearing impairment. Frequently the parents give good evidence for hearing in statements such as 'sometimes he seems to hear me.' Often these children will produce speech such as *yes* and *no* inadvertently under stress situations or when they are separated from their parents. This means that we can conclude that they have been able to hear within normal limits in order to have learned to speak these words. These children, furthermore, have poor contact with their environment in general; they are no more interested in things than they are in people. Their laughter, vocalization and gait are not unlike those of the normally hearing child. Often paradoxically they respond to what might be called pleasant sounds of *low* intensities, but show no response to sounds of high intensities even though these latter sounds might be expected to stimulate fear.

Another challenging problem in the hearing clinic is that of the differential diagnosis between children who are aphasic and children with hearing impairment. This problem is especially apparent in children with mixed expressive and receptive aphasia, although simple expressive and simple receptive aphasia are occasionally confused with deafness. Certain behavioral symptomatology again can be used to pursue the differential diagnostic patterns. The following characteristics are pertinent to aphasic children: (1) They often are attentional problems in terms of perservation. They persist in attending to one thing at a time to an unusual degree. (2) Sounds which they have not learned to ignore will get through to the attention within the limits of normal hearing. This type of aphasic learns to ignore sound because it has no meaning to him. Thus an unusual sound stimulus might produce a response once or twice but then the child has already learned to ignore it and he will no longer respond to that particular stimulus. This sometimes results in the paradox of the aphasic child not responding to sounds even though they are near the pain threshold level, while the child who has a true hearing loss, even though severe, usually will respond when the sound reaches his threshold. (3) The aphasic child can be trained or conditioned to respond to sounds which he has learned to interpret. For example, in one instance an aphasic child had learned to respond to the noises made when taking a cookie out of a jar. This one clue of normal hearing was later verified and by similar techniques it was possible to determine that the child's hearing fell within normal limits. It should be noted that this child ignored all other sound stimuli when hearing testing was first attempted. (4) Again, vocalizations, gait and sound improvization are not unlike the normal child. (5) Vestibular tests usually reveal normal functioning and motor tests often reveal disturbances of coordination. (6) Psychological test patterns sometimes reveal characteristic perceptual disturbances of the brain-damaged; mental functioning is relatively better with the concrete than with the abstract.

Another problem confronting both the clinical audiologist and the clinical psychologist is the adequate differentiation between deaf and mentally deficient children. The psychologist, perhaps has erred most often in erroneously diagnosing deaf children as mentally deficient. This is unfortunate and the audiologist has a responsibility in bringing about better diagnostic procedures in this respect. He should not, however, go to the other extreme and erroneously include the mentally deficient with the deaf. Some of the characteristic behavioral symptomatology of the mentally de-

ficient includes: (1) A deficiency of curiosity, imagination, attention and interests. (2) A generalized retardation in learning to care for himself; the deaf child is retarded in specific aspects of socialization. (3) Response to sound is erratic, especially if pure tones are used. (4) Subtle responses to normal speech sounds often can be elicited. (5) Vocalizations are made for pleasure and the quality is unlike that of the child with hearing impairment. (6) There is a relatively high incidence of physical stigmata with generalized hypoplasia. (7) The expression, especially use of the eyes and hands, is unlike that of the hearing-impaired child. (8) Mental test results, while not always conclusive, usually reveal marked retardation of the mentally deficient and scores within average limits for the deaf child.

A related problem in differential diagnosis is that of determining how much of the communicative disorder in a particular individual is due to hearing disability and how much is due to other factors. This is the problem of the multiple handicap with its concomitant problems of educational classification, the use of hearing aids, and many others. The problem of the multiple-handicapped child thus includes consideration of inviduals who have hearing losses superimposed on other disabilities. Examples are the cerebral palsied, the visually impaired, and the mentally retarded who also have sustained various degrees of hearing impairment. Individuals presenting two or more disabilities, including hearing impairment, present complex problems audiologically. Methods and techniques for complete audiological assessment are inadequate and must be devised. The primary suggestion from the point of view of clinical psychology is that individuals with more than one handicap are best classified psychologically when they are classified on the basis of their major handicap. In certain cases this suggestion becomes somewhat academic because all of the handicaps are so severe that they require equal emphasis. In general the major handicap can be ascertained, however, and should be the basis for classification and program planning. For example, the mentally deficient child is provided with his best opportunities when he is classified for training with other mentally deficient children and his deafness is considered to be a secondary handicap.

To summarize, one of the most difficult and challenging tasks is the differential diagnosis between individuals who have communicative disorders due to hearing impairment and those with communicative disorders due to other causes. There is the problem of determining the relative significance of the hearing impairment when it is superimposed on other handicaps. These are problems in clinical procedures and research. They represent a common ground for the clinical psychologist, who is not traditionally oriented to the problems of individuals with hearing impairment, but who is oriented to the problems of human beings, and for the audiologist, who at the present time is oriented to the problems of hearing primarily from the point of view of medicine and physics.

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# A Study of the Relationship between Speech Thresholds and Audiometric Results in Perception Deafness

E. Thayer Curry*

THIS study is one of a series by the author in which the general purpose has been to determine the relative contribution made by individual frequencies to the identification of spoken and whispered digits. The present study is intended to add to the previous findings by examining a group of individuals classified by otologists as cases of perceptive hearing loss. The general problem is, of course, the very broad one of speech intelligibility, many aspects of which have been studied by previous investigators. Beasley (**1**), Bunch (**2**), Carhart (**3, 4, 5**), Fletcher (**9**), Fowler (**10**), Goldman (**11**), Harris (**12**), Hughson and Thompson (**13**), MacFarlan (**14**), and Steinberg and Gardner (**15**) have all reported on certain aspects of the relationship between audiograms and speech perception and recognition.

It has been the specific purpose of this study to examine statistically the degree of the association between two measures: (1) air conduction and bone conduction loss in decibels for the individual frequencies 256, 512, 1024, 2048, 4096, and 8192, and (2) the distance measured in feet that spoken and whispered digits could be identified by the individual with a perceptive hearing loss. Most of the studies cited have been concerned with the relation of an average decibel loss for selected frequencies of the audiogram. For purposes of comparison, similar averages have been computed and correlated in this study.

*E. Thayer Curry (Ph.D., Iowa, 1939) is Associate Professor of Speech, University of Illinois.

## Subjects

Clinical data, including test results, for a group of individuals with perceptive hearing loss were obtained from the files of the Speech and Hearing Clinic of the University of Washington. The cases used in this study were from the following groups: (1) undergraduate and graduate students at the University of Washington, (2) students referred to the University Clinic from the grade, junior high and senior high schools of Seattle, (3) individuals referred to the University Clinic by the Veterans Rehabilitation Administration offices in Seattle, (4) individuals referred by physicians and otological specialists of Seattle and the nearby area, (5) individuals referred by various hearing aid dealers of the State of Washington, and (6) other individuals who presented themselves at the University Clinic for testing and retraining services.

The subjects used in the analysis are those who were carefully evaluated by the referring otologist and designated as cases of perceptive type hearing loss. In making this diagnosis the individual otologist considered: the case history of the patient, a careful evaluation of the audiogram (involving both air and bone conduction thresholds), and an examination of

the tympanic membrane and the nasopharynx. All cases so designated for whom the complete data necessary for this analysis were available were included in the statistical study. The age range of the subjects was 14-56 years.

### Procedure

Part of the standard procedure for testing hearing cases at the Speech and Hearing Clinic of the University of Washington during the academic year 1947-48 included the Speech-Whisper Test when indicated. For the cases of this study, the Speech-Whisper Test was in all instances administered by the same individual. The voice used for the test was that of an adult male, age 35; the average pitch level of this voice previously had been determined (**7**) to be 131 c.p.s. The test was always administered in a room the dimensions of which were 22 × 16, with a ceiling eight feet above the floor. The surface of the ceiling was treated with Acousti-Tex tile. The room chosen for testing was not a long, hall-like space as is frequently used for giving this test. This choice follows the recommendation of Harris (**12**) who discusses fully the reasons for not using an alley type of space.

The Speech-Whisper Test is completely described by Fletcher (**9**). Briefly, in the method used in this study, the tester pronounced digits while moving slowly away from the subject. The score for the test was the greatest distance (in feet) that the subject could identify the digits presented. In the procedure described by Fletcher, the score for the test was the distance where the subject just fails to identify the digits presented. It was decided that for this study the determination of the point where digits were identified was a more specific procedure than the determination of the point where digits could not be identified. The present procedure differs from Fletcher's, therefore, in the respect noted.

The audiometers used for the study were a Sonotone Model 20 and an Audio Development Company Model 50E. These two audiometers were calibrated at the outset of the study. Their adjustment was checked once a week during the period of the collection of the data against the known hearing curves of two individuals. The audiograms secured during the checking process did not in any instance deviate more than five db from the original audiogram. For the purposes of this study, it was felt that the audiometers remained in essential calibration during the period of the study.

The individual hearing loss in decibels for air conduction at the frequencies 256, 512, 1024, 2048, 4096, and 8192 was correlated against the speech score in feet by the product-moment correlation coefficient according to the statistical method described by Edwards (**8**). Coefficients were also determined for bone conduction losses at the same frequencies and correlated with the speech score. All air and bone conduction losses for individual frequencies were then correlated with the whisper score.

The percentage value for the American Medical Association Percentage Hearing Loss was determined according to the directions given by that association (**6**). This percentage loss was then correlated with the speech score by the method cited above. The percentage loss was also correlated with the whisper score using the same method.

The average audiometric loss was computed by averaging the decibel loss values for 512, 1024 and 2048 c.p.s. and multiplying by 0.8, as described for the Bell procedure used by Hughson and Thompson (**13**). This average loss was then correlated with the speech score and with the whisper score by the product-moment method.

Goldman (**11**) has presented speech and whisper test results for a group of 53 nerve type loss cases. In the same table he also lists the loss for

TABLE 1. Correlation of speech score with hearing loss, as measured audiometrically, including levels of significance and explanation of variance.

| *Hearing Loss at Freq.* (1) | *AC or BC* (2) | *Product-Moment r* (3) | *Sign. at 1% Level* (4) | *Sign. at 5% Level* (5) | *Variance Explained by r* (6) | *Variance Unexpl. by r* (7) | *Qualitative Evaluation of Association* (8) |
|---|---|---|---|---|---|---|---|
| 256 | AC | .480 | No | No | .230 | .770 | |
| | BC | −.089 | No | No | .008 | .992 | |
| 512 | AC | .742 | Yes | Yes | .551 | .449 | Moderate, Positive |
| | BC | .634 | Yes | Yes | .402 | .598 | Low, Positive |
| 1024 | AC | .527 | No | Yes | .278 | .722 | Low, Positive |
| | BC | .340 | No | No | .116 | .884 | |
| 2048 | AC | .503 | No | Yes | .253 | .747 | Low, Positive |
| | BC | .315 | No | No | .099 | .901 | |
| 4096 | AC | .347 | No | No | .120 | .880 | |
| | BC | .628 | Yes | Yes | .394 | .606 | Low, Positive |
| 8192 | AC | .533 | No | Yes | .284 | .716 | Low, Positive |
| | BC | .081 | No | No | .007 | .993 | |

each ear averaged for the frequencies 256, 512, 1024, and 2048. The author has computed the product-moment correlation for the data which Goldman presented. A comparison was made between the results obtained from the Goldman study and a similar computation made for the comparable values of this study.

## RESULTS

The statistical analysis of the results of this study is presented in Tables 1, 2, and 3.

Table 1 presents the correlation of speech scores with hearing loss. Column 1 lists the specific frequency values which were correlated with the speech score. Column 2 indicates whether the $r$ was computed for air or bone conduction loss. Column 3 lists the correlation coefficient obtained by the product-moment correlation method described by Edwards (8). It will be seen that the obtained $r$ values range from a low of .081 for 8192 BC to a high of .742 for 512 AC. One negative value is noted in this table, but this relation is not shown to be significant.

Column 4 indicates whether or not the obtained $r$ is significant at the 1 per cent level. That is, we can say with statistically great certainty that there is a degree of association between the calculations of our study for which the $r$ is significant at the 1 per cent level. In the values of this study, the degree of association indicated is usually low, but in three of the 12 values the association is highly significant at the 1 per cent level. Column 5 indicates that three of the values which were not significant at the 1 per cent level show significance at the 5 per cent level. Those $r$ values which did not indicate a statistical significance were those for the correlations 256 AC, 256 BC, 1024 BC, 2048 BC, 4096 AC, and 8192 BC.

Column 6 indicates the statistical value of the variance of these two correlated quantities which is explained by the correlation coefficient $r$. It will be noted that the variance 'explained' is relatively low—varying

from .007 for 8192 BC to .551 for 512 AC. Column 7 indicates the statistical value of the variance of these two correlated quantities which is *not* explained by the calculated *r*. These values of unexplained variance range between .449 for 512 AC and .993 for 8192 BC. Column 8 lists a qualitative evaluation of the degree of association between the two quantities correlated. For the six values of the study for which a degree of association was indicated, the qualitative evaluation given by Edwards (8) is shown. The correlation for 512 AC and speech score indicates a statistically 'moderate' degree of association. Correlations for 512 BC, 1024 AC, 2048 AC, 4096 BC, and 8192 AC indicate a statistically 'low' degree of association. For the other correlations there is no certainty that there is any degree of association at all.

It will be noted that the *r* value at each frequency, with the single exception of 4096 cycles, uniformly indicates a higher degree of association for the air conduction correlation than for the bone conduction correlation. At 4096 cycles the BC score indicates a much greater degree of association than does the AC score for the same frequency. This is a matter which will be investigated further in additional studies.

Table 2 presents the correlation of whisper scores with hearing loss. Column 1 lists the specific frequency values which were correlated with the whisper score. Column 2 indicates whether the *r* was computed for air or bone conduction loss. Column 3 shows that the obtained *r* values range from a low of .109 for 8192 AC to a high of .604 for 4096 AC. Four negative values occur in the column, but this indicated association is not shown to be significant.

In general, the whisper score indicates a very low degree of association with the decibel losses for the frequencies correlated. Column 4 indicates that no one of the obtained *r* values is significant at the 1 per cent level. Column 5 indicates that only three of the correlations are statistically significant at the 5 per cent level. Column 6 indicates low values

TABLE 2. Correlation of whisper score with hearing loss, as measured audiometrically, including levels of significance and explanation of variance.

| *Hearing Loss at Freq.* (1) | *AC or BC* (2) | *Product-Moment r* (3) | *Sign. at 1% Level* (4) | *Sign. at 5% Level* (5) | *Variance Explained by r* (6) | *Variance Unexpl. by r* (7) | *Qualitative Evaluation of Association* (8) |
|---|---|---|---|---|---|---|---|
| 256 | AC | −.213 | No | No | .045 | .955 | |
| | BC | .239 | No | No | .057 | .943 | |
| 512 | AC | −.026 | No | No | .001 | .999 | |
| | BC | −.078 | No | No | .006 | .994 | |
| 1024 | AC | .150 | No | No | .023 | .977 | |
| | BC | −.116 | No | No | .013 | .987 | |
| 2048 | AC | .516 | No | Yes | .266 | .734 | Low, Positive |
| | BC | .583 | No | Yes | .340 | .660 | Low, Positive |
| 4096 | AC | .604 | No | Yes | .365 | .635 | Low, Positive |
| | BC | .357 | No | No | .127 | .873 | |
| 8192 | AC | .109 | No | No | .012 | .988 | |
| | BC | .225 | No | No | .051 | .949 | |

TABLE 3. Correlation of hearing loss, calculated by different methods, with selected research results, including levels of significance and explanation of variance.

| *Average Hearing Loss* (1) | *Type of Score* (2) | *Product-Moment r* (3) | *Sign. at 1% Level* (4) | *Sign. at 5% Level* (5) | *Variance Explained by r* (6) | *Variance Unexpl. by r* (7) | *Qualitative Evaluation of Association* (8) |
|---|---|---|---|---|---|---|---|
| AMA % Hearing Loss | Curry Speech Score | .725 | Yes | Yes | .526 | .474 | Moderate, Pos. |
| AMA % Hearing Loss | Curry Whisper Score | .407 | No | No | .166 | .834 | |
| AC at 512, 1024, 2048 | Curry Sp. Score | .802 | Yes | Yes | .643 | .357 | High, Positive |
| AC at 512, 1024, 2048 | Curry Wh. Score | .163 | No | No | .027 | .973 | |
| AC at 256, 512, 1024 and 2048 | Goldman 'Whisper' Score | .553 | Yes | Yes | .306 | .694 | Low, Positive |
| AC at 256, 512, 1024 and 2048 | Goldman Selected Cases* | .402 | Yes | Yes | .162 | .838 | Very Low, Positive |
| AC at 256, 512, 1024 and 2048 | Curry Speech Score | .780 | Yes | Yes | .608 | .392 | High, Positive |
| AC at 256, 512, 1024 and 2048 | Curry Whisper Score | .067 | No | No | .004 | .996 | |

* Recalculation of original Goldman data, eliminating ears showing no loss on either audiometer or speech whisper score.

of 'explained' variance. Column 7 indicates high values of unexplained variance. Column 8 shows the qualitative evaluation of the degree of association. Three correlations indicate a low, positive association, namely: 2048 BC, 2048 AC, and 4096 AC. For the other correlations there is no certainty of any degree of association at all.

Table 3 presents the correlation of hearing loss, calculated by different methods, with selected research results. Column 1 lists the specific make-up of the average loss used in the correlations for Table 3. For some values, the AMA Percentage Hearing Loss was calculated and correlated with the score indicated in Column 2. Air conduction losses at 512, 1024 and 2048 were averaged and the value correlated for speech and whisper scores. Air conduction losses at 256, 512, 1024 and 2048 were averaged and correlated in four instances listed by the two columns. Column 3 lists the value for the obtained product-moment *r*. The range of the obtained values is considerable. Column 4 indicates that five of eight values are significant at the 1 per cent level. Column 5 shows that values were either highly significant at the 1 per cent level or did not indicate significance at all, since no additional

values were significant at the 5 per cent level.

Column 6 indicates the statistical value of the variance which is explained by *r*, while Column 7 indicates the unexplained value of the variance. For certain values in Table 3, a greater degree of association is shown than for the association with single frequency losses of Tables 1 and 2. Column 8 evaluates qualitatively this association. Two values, AC losses average for 256, 512, 1024 and 2048 from the author's present study and the AC loss average for 512, 1024 and 2048 from the same data, when correlated with the speech score indicate a statistically 'high,' positive degree of association. Only a 'moderate' degree of association between the speech score and AMA Percentage Hearing Loss is shown. Other correlations indicate either a 'low,' 'very low,' or no degree of association.

The correlation between the whisper scores and averaged loss of any type did not indicate any certainty of association. Goldman (**11**) has indicated at best a 'low,' positive correlation for his whisper scores with the AC loss average which he used. Comparable data of the present study indicate practically no degree of association. However, when the speech score is correlated with the same AC average, a 'high' positive correlation is obtained. These differences in results may possibly be explained by the fact that the two studies used radically different types of rooms for the speech-whisper test.

## Conclusions

It should be remembered that the results presented here are for a specific group of cases, in a specific testing room, with a particular speaking voice. Every effort has been made to control the variables of testing voice, audiometers, testing room, and administration of the speech-whisper test itself.

For the selected group of perceptive type deafness cases, we can indicate the following conclusions based on the results of the present study:

1. Correlations between AC loss and speech score indicate greater association than between BC loss and speech score. The single exception to this generalization is at 4096 cycles where the BC loss correlates higher than AC loss with the speech score.

2. Whisper scores, when correlated with AC and BC losses, indicate a much less degree of association than speech scores at the frequencies: 256, 512, 1024, and 8192. In certain instances, at 2048 and 4096, the whisper score correlation indicates a higher degree of association than does the speech score correlation.

3. Eight different averaged loss scores were correlated with speech and whisper test results. For the perceptive subjects of the present study the greatest degree of association was indicated for the correlation between the AC loss average at 512, 1024, and 2048 and the speech score.

This finding is essentially equivalent to Carhart's statement that loss according to the puretone average (512-1024-2048) was found to equal the loss according to the speech reception score. Hughson and Thompson have previously pointed out, and Carhart has restated, that the frequencies 128, 256, and 8192 are of little significance in relation to speech reception. Carhart has also pointed out that speech reception appeared to be more dependent upon acuity at 512 and 1024 cycles than upon acuity at 2048; the present study lends weight to this opinion.

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# A Study of the Relationship between Measured Hearing Loss and Intelligibility of Selected Words

Bruce M. Siegenthaler*

IT IS KNOWN that the hearing acuity of an individual plays a part in his perception of speech sounds. It is also known that the intelligibility of speech is dependent, in part, upon the characteristics of the speech itself. These two aspects of communication have often been studied, but seldom have they been related. For example, word and sentence lists have been used to measure the thresholds for speech of hard-of-hearing persons, but without consideration of the phonetic factors which made the test items intelligible —or not intelligible—to the subjects.

The twofold aspect of communication perhaps should be considered concurrently when dealing with the hard-of-hearing. It may be of importance when testing the hearing acuity of a hard-of-hearing person, when selecting a hearing aid for him, or when giving him auricular and speech training, to know more about the use he can make of his hearing. Such information may be important when planning the therapeutic program for a hard-of-hearing person who has a given degree of hearing loss and pattern of hearing acuity as measured by the pure tone audiometer.

The purpose of the experiment reported here was to explore factors and the relative importance of factors which affect the intelligibility of words for hard-of-hearing persons and for persons with normal hearing when the speech is delivered to the persons at intensities near their thresholds for spondee words.[1] Of the many variable factors which affect the intelligibility of words, only three were arbitrarily chosen to be studied in the experiment. The variable factors selected were (a) voicing of consonants, (b) pressure pattern of consonants, and (c) the influence of one 'sound'[2] upon another within a word. Other possible variables, such as intensity level, syllabification, phonetic elements, rate, pitch, and voice quality of the announcer, were held constant.

## Word Lists

In order to be reasonably certain that the words used in the experiment would be familiar to the subjects and within the vocabularies of most persons, all words used were taken from lists that have been used for the purpose of articulation testing (**1, 3, 5**).

The words used in the experiment

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[1]Spondee words are considered to be words of about equal difficulty which are bi-syllabic with equal stress on both syllables. Spondee-word-thresholds were obtained using the technique described in 'The development of recorded auditory tests for measuring hearing loss for speech' (**2**). However, live voice was used instead of the recorded form of the test.

[2]As used here, the word 'sound' does not refer to an auditory effect, but rather to the movements and positions of the articulators required for the production of a speech sound. See discussion of this factor under Word Lists.

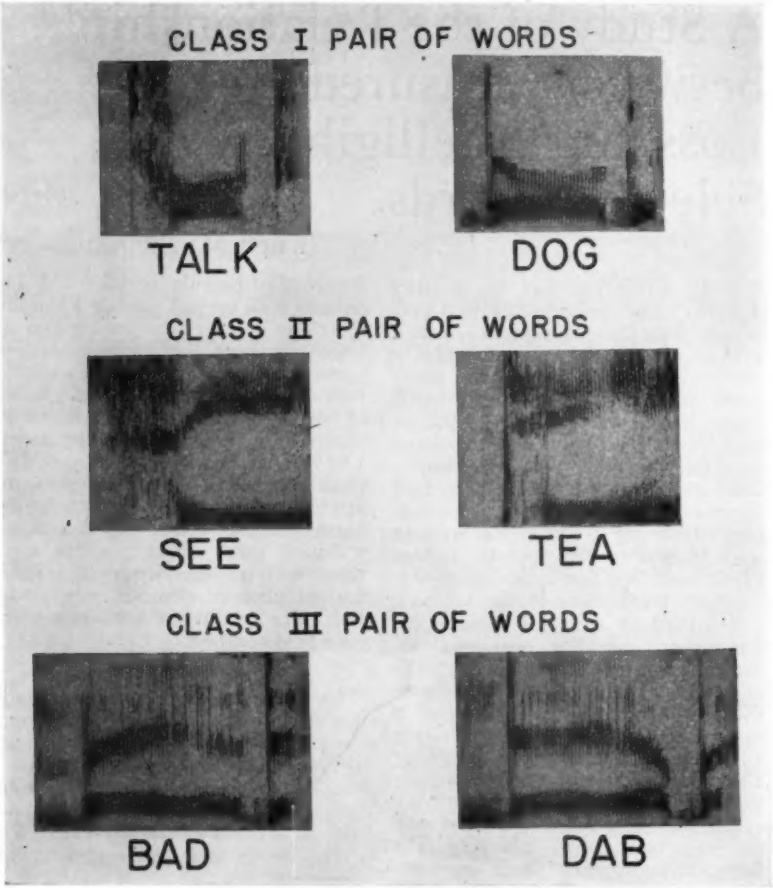


FIGURE 1. Acoustic spectrograms of representative words in the word test.

were analyzed according to their acoustic spectrograms (visible speech patterns) and the existence of the desired similarities and differences were validated by reference to the spectrograms. The spectrograms were made on a Bell Telephone Laboratories Sound Spectrograph. Acoustic spectrograms of words representative of those used in the experiment are reproduced in Figure 1.

In the experiment the basic unit was a pair of words which had a single known difference between them, with other variables between the two words eliminated. The experimental word lists were made up as follows: one syllable words were paired to have the same vowel in both words and matched to have the same consonant-vowel-consonant (or consonant-vowel) order. Three lists of paired words were made

so that only one of the variables of voicing, pressure pattern, or influence was different between the paired words of a list.

An example of a pair of words which has different voicing of consonants is *talk* [tɔk] and *dog* [dɔg]. In *talk* the consonants are unvoiced, while in *dog* the consonants are voiced. In this pair of words the pressure pattern was considered to be of a similar order (i.e., the respective consonants are both plosives), and the influence, as mentioned later, is similar. Twenty pairs of words with a difference in voicing of consonants were designated as Class I. (See Figure 1 for acoustic spectrograms of the above words.)

The pressure pattern of consonants was considered to be of the plosive, the continuant, or the affricate type. Twenty pairs of words were selected to make Class II in which the pressure pattern was considered to be different between words of a pair. An example of a Class II pair of words is *see* [si] and *tea* [ti]. Here the voicing of the consonants is the same, and the influence is considered to be similar, but the pressure patterns of the respective consonants are continuant and plosive (See Figure 1). In Class II there were 10 pairs of words containing unvoiced consonants and 10 pairs containing voiced consonants.

Influence, as described by Potter, Kopp, and Green (**4**), refers to the interrelationships between movements and positions required for the production of any two speech sounds spoken in succession. In terms of the acoustic spectrograms, the influence factor is usually most noticeable in the second resonance bar of the vowel pattern. Because of the change in the size and shape of the oral cavity as the articulators move from the position required for the production of one sound to the position required for the production of the following sound, the cavity modulation which takes place during the movement appears on the spectrogram as apparent movement of the resonance bars. An example will show the meaning of influence as considered for this study. Consider the sounds [s] and [t]. Both are alveolar sounds made with the articulators in about the same positions, and both are considered to have about the same influence upon a vowel. Thus in the words *see* [si] and *tea* [ti] the influence upon [i] is similar as shown by the acoustic spectrograms. However, when considering the sounds [b] and [d] it is noticed that [b] is a bi-labial while [d] is an alveolar sound. Therefore [b] and [d] have different influences upon a vowel as in the pair of words *bad* [bæd] and *dab* [dæb] (See Figure 1).

Class III pairs of words were of the type *bad* and *dab* in which the respective consonants have the same voicing and similar pressure patterns, but in which there are different influences upon the vowel (See Figure 1). In Class III there were 10 pairs of words containing unvoiced consonants and 10 pairs containing voiced consonants.

A Master Word List was compiled by putting all of the different words used to make the classes of pairs of words into one list. Since all of the consonants in any one word in the list are either unvoiced or voiced, it was possible to divide the Master Word List into words containing only unvoiced consonants and words containing only voiced consonants. There were 112 words in the Master Word List of which 59 contained unvoiced consonants and 53 contained voiced consonants. The Master Word List was intended to be used as a test of the intelligibility of these two types of words. (In the original experimental plan there were seven classes of pairs of words. The Master Word List was compiled from all seven classes. Therefore, some words in the list are not found in Classes I, II, or III.) The three classes of pairs of

words and the Master Word List comprised the Word Test.

### Subjects

The subjects used for the experiment were classified according to the pattern of hearing acuity each displayed when given a pure tone threshold test with a Maico D-9 audiometer. There were five subjects who showed audiograms indicating about equal loss of acuity for the frequencies 128 through 8192 c.p.s. They were designated as Group A subjects. Group A subjects were of the following age and sex: 25 (F), 32 (F), 42 (M), 43 (F), and 45 (M). Five subjects showed a much greater loss of acuity for the high frequencies than for the low, and they were designated as Group B subjects. Group B subjects were all males, and of the following ages: 17, 21, 52, 57, and 67. These persons had come to the Hearing Division of the University of Michigan Speech Clinic because they considered themselves to have a hearing loss. Five subjects were also selected who had hearing acuity within normal limits for all pure tones tested. These were designated as Croup C subjects. Group C subjects were of the following age and sex: 24 (F), 25 (F), 29 (M), 35 (M), and 48 (F). All subjects, with the exception of one who had a severe congenital perceptive hearing loss, were tested for experimental purposes without the aid of individual acoustic amplification. Sample audiograms of the three types considered are reproduced in Figure 2. These are 'better ear' audiograms made for the purpose of selecting and classifying subjects.

### Procedure

An attenuated speech reception test was used to determine the spondee-word-threshold for each subject. This threshold was called the Index Level.

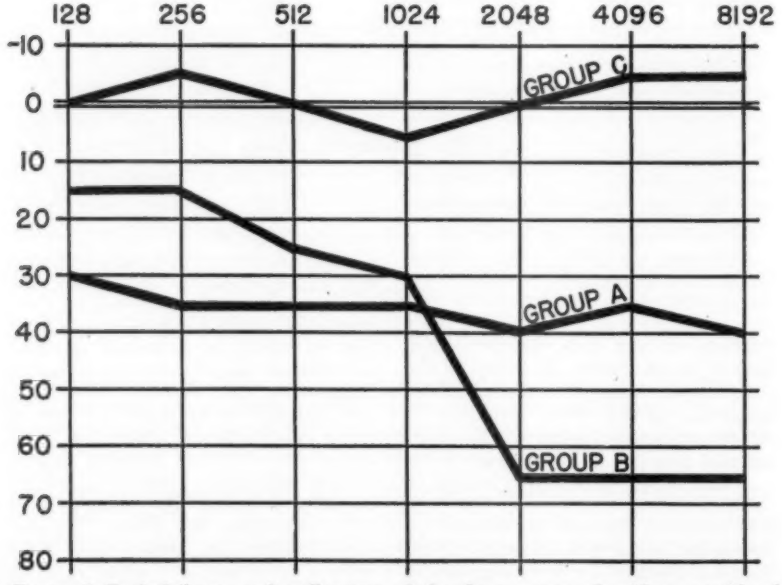


Figure 2. Typical 'better ear' audiograms of the three groups of subjects considered for the word test.

TABLE 1. Total scores (no. of items correct) made by groups of subjects on Word Test.

| | *Intensity Level* | *Classes of Pairs of Words* I | II | III | *Master Word List* *Unv.** | *Vo.*† |
|---|---|---|---|---|---|---|
| Total scores made by Group A | Index +5 db | 93 | 86 | 96 | 248 | 197 |
| | Index Level | 86 | 83 | 86 | 212 | 142 |
| | Index −5 db | 76 | 75 | 75 | 138 | 74 |
| Total scores made by Group B | Index +5 db | 94 | 81 | 65 | 100‡ | 114‡ |
| | Index Level | 91 | 54 | 69 | 73‡ | 96‡ |
| | Index −5 db | 94 | 60 | 59 | 57‡ | 75‡ |
| Total scores made by Group C | Index +5 db | 99 | 94 | 98 | 259 | 224 |
| | Index Level | 96 | 88 | 95 | 214 | 169 |
| | Index −5 db | 89 | 78 | 81 | 130 | 107 |
| Total possible at any intensity level | | 100 | 100 | 100 | 295 | 265 |

* Words containing unvoiced consonants.
† Words containing voiced consonants.
‡ Subjects 6-10 comprised Group B subjects. Subject 6 was not tested on the Master Word List. These scores are the total scores made by Subjects 7-10 multiplied by 5/4.

When the words of the experiment were administered, the subject's Index Level was used as a reference to determine the intensity at which he heard the stimuli. In this manner it was intended to make the experimental words equally difficult with respect to intensity for all subjects.

The factor of intensity level was controlled for presentation of the experimental words in that the announcer monitored his voice with the aid of a VU meter. The speech was transmitted by a microphone and an amplifier, and regulated in intensity by a set of attenuators which made possible attenuation over a range of 90 db in 1 db steps. The speech was delivered to the subject in a sound treated room through a loud speaker.

The carrier phrase, 'The next word is . . . .,' was used before each test item. Except for the monitoring of the level of his voice the announcer made no attempt to modify his voice, and in all items a normal speech pattern was used. The same announcer —male, 26 years old, with Midwestern speech—administered the Word Test to all subjects.

The general methods of experimentation was to select a pair of words with a controlled difference between them, to make both of the words known to the subject by means of a prepared test blank, and to present one of the words to the subject as a speech stimulus. The subject responded by indicating which of the two words he thought he heard. The Master Word List was presented as an unpaired word list to which the subject responded by writing the word he thought he heard. The classes of pairs of words and the Master Word List were presented to the subject at three intensity levels: Index Level +5 db, Index Level, and Index Level −5 db.

## Results

The responses which the subjects made to the Word Test were scored as being correct or incorrect. The total correct responses for each group of subjects on each part of the Word Test at each intensity level are tabulated in Table 1.

A *t*-test was used as a measure of the significance of the differences between the respective total scores made by the groups of subjects on each part of the Word Test. If the *t* value equalled or was greater than 1.96, the two compared scores were considered to be significantly different at the five per cent level. If the *t* value equalled or was greater than 2.58, the two compared scores were considered to be significantly different at the one per cent level. Group A scores were compared with the respective scores made by Group B, Group A scores were compared with the respective scores made by Group C, and Group B scores were compared with the respective scores made by Group C. The *t* values obtained from these inter-group comparisons are found in Table 2. Comparisons were also made between the scores of each group of subjects on each part of the Word Test with the scores made on other parts of the Word Test by the same group of subjects. The *t* values obtained from these intra-group comparisons are found in Table 3. In this manner an evaluation was made of the relative importance of the factors which affect the intelligibility of words as considered in this study for groups of subjects who have different patterns of hearing acuity.

After the comparison of scores was

Table 2. Tests of significant differences between total scores made by groups of subjects on the Word Test.

a. *t* values comparing total scores made by Group A with total scores made by Group B

| *Intensity Level* | *Class* I | II | III | *M. W. L.* *Unvo.** | *Vo.*† |
|---|---|---|---|---|---|
| Index +5 db | − .29 | .95 | 5.53 | 11.82 | 6.97 |
| Index Level | −1.11 | 4.41 | 2.88 | 10.83 | 3.76 |
| Index −5 db | −3.56 | 2.26 | 2.41 | 6.90 | .20 |

b. *t* values comparing total scores made by Group A with total scores made by Group C

| *Intensity Level* | *Class* I | II | III | *M. W. L.* *Unvo.** | *Vo.*† |
|---|---|---|---|---|---|
| Index +5 db | −2.17 | −1.89 | − .83 | −1.30 | −2.90 |
| Index Level | −2.47 | −1.00 | −2.17 | − .18 | −2.38 |
| Index −5 db | −2.42 | − .50 | −1.02 | .66 | −3.02 |

c. *t* values comparing total scores made by Group B with total scores made by Group C

| *Intensity Level* | *Class* I | II | III | *M. W. L.* *Unvo.** | *Vo.*† |
|---|---|---|---|---|---|
| Index +5 db | −1.92 | −2.78 | −6.01 | −12.85 | −9.53 |
| Index Level | −1.43 | −5.30 | −4.79 | −10.99 | −5.96 |
| Index −5 db | 1.27 | −2.75 | −3.39 | −6.32 | −2.64 |

* Words containing unvoiced consonants.
† Words containing voiced consonants.

Note: No sign before a *t* value indicates that the first named group of subjects had a higher score than the second named group of subjects. A minus sign before a *t* value indicates that the second named group of subjects had a higher score than the first named group of subjects.

TABLE 3. Tests of significant differences between total scores made on each part of the Word Test and total scores made on other parts of the Word Test by the same group of subjects.

a. *t* values comparing total scores made by Group A subjects

| *Intensity Level* | *When comparing scores on Classes* I and II | I and III | II and III | *When comparing Unvo. with Vo. word scores on M. W. L.* |
|---|---|---|---|---|
| Index +5 db | 1.60 | −.93 | −2.50 | 2.85 |
| Index Level | .58 | 0.01 | −.58 | 4.48 |
| Index −5 db | .17 | .17 | 0.00 | 4.59 |

b. *t* values comparing total scores made by Group B subjects

| *Intensity Level* | *When comparing scores on Classes* I and II | I and III | II and III | *When comparing Unvo. with Vo. word scores on M. W. L.* |
|---|---|---|---|---|
| Index +5 db | 2.77 | 5.10 | 2.55 | −1.96 |
| Index Level | 5.87 | 3.88 | −2.15 | −2.70 |
| Index −5 db | 5.70 | 5.84 | .14 | −2.64 |

c. *t* values comparing total scores made by Group C subjects

| *Intensity Level* | *When comparing scores on Classes* I and II | I and III | II and III | *When comparing Unvo. with Vo. word scores on M. W. L.* |
|---|---|---|---|---|
| Index +5 db | 1.92 | .58 | −1.43 | 1.12 |
| Index Level | 2.08 | .34 | −1.77 | 2.23 |
| Index −5 db | 2.07 | 1.56 | −.53 | .88 |

NOTE: No sign before a *t* value indicates that the first named class score was higher than the second, or that the Unvoiced score was higher than the Voiced. A minus sign before a *t* value indicates that the second named class score was higher than the first, or that the Voiced score was higher than the Unvoiced.

completed, several general observations were made concerning the performance of the groups of subjects on the Word Test. Normal-hearing subjects perceived differences in voicing, pressure pattern, and influence between words of a pair better than either of the other two groups of subjects, and they had better perception for words of the Master Word list than either Group A or Group B subjects (See Table 2). It was observed that normal-hearing subjects had about equal perception for voicing and influence differences with poorer perception for pressure pattern differences between words of a pair, and that normal-hearing subjects had about equal perception for words containing unvoiced consonants and for words containing voiced consonants (See Table 3).

Group A subjects (low, level audiograms) perceived differences in pressure pattern and influence between words of a pair better than did Group B subjects, and perceived words of the Master Word List better than did Group B subjects (See Table 2). Group A subjects had about equal perception for voicing, pressure pattern, and influence differences between words of a pair, and also perceived words containing unvoiced consonants better than words containing voiced consonants in the Master Word List (See Table 3).

Group B subjects (high tone loss audiograms) perceived voicing differences better than either pressure pattern or influence differences between words of a pair, and they perceived words containing voiced con-

sonants better than words containing unvoiced consonants (See Table 3).

While Group A and Group B subjects had about equal perception for voicing differences between words of a pair, in general Group A performed more nearly like the normal-hearing subjects on the Word Test than did Group B subjects. Group B subjects performed much poorer on the Word Test than did either of the other two groups of subjects (See Tables 1 and 2).

## Summary and Conclusions

In the described experiment an investigation was made of the ability of two distinct types of hard-of-hearing persons and a group of normal-hearing persons to perceive differences in (a) voicing of consonants, (b) pressure pattern of consonants, and (c) influence of one 'sound' upon an other within a word. Also, an estimate was made of the abilities of the three groups of subjects to perceive words containing unvoiced consonants and words containing voiced consonants. The word lists used for the experiment are described, and a discussion of the experimental technique is given.

In view of the experimental results, it is evident that persons with different patterns of hearing acuity for pure tones give different and distinctive patterns of responses to selected words administered in the manner of the Word Test. Furthermore, the concept that an equal amount of hearing loss for the pure tones usually tested with the pure tone audiometer has the effect of simply raising the threshold for speech, is not supported by the experimental results.

It is realized that the present study utilized only a small number of subjects, that only a limited number of audiogram types was considered, and that several aspects of the Word Test may need to be revised. However, in several instances the results do seem to be indicative of the factors and the relative importance of factors which affect the intelligibility of words.

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# An Experimental Study of Tests for the Detection of Auditory Malingering

Glenn J. Taylor*

THE problem of measuring the hearing loss, or lack of loss, when unilateral deafness is claimed has confronted military authorities and otologists for many years, and many tests and devices have been proposed to detect the malingerer. Harbert (**7**), Priest (**9**), Grove (**6**), and others have reviewed the tests, but evidence of experimental evaluation of the effectiveness of the tests is lacking both in reviews and in original reports. Bunch (**3**) concluded that the appearance of new tests from time to time indicated that those that have been used were unsatisfactory. Firestone (**4**) supports this view by stating that frequently it is not the accused, but the skill of the otologist, that is on trial in medico-legal cases, and that because of the lack of means of making results clear to a jury injustice may be done to the accused or to the otologist's reputation.

This study was designed to assess the effectiveness of certain common principles on which many tests of malingering have been based, and to determine whether results of tests could be expressed in objective terms that would describe the qualitative and quantitative aspects of an alleged unilateral loss.

## Selection of Tests

Tests that could be administered by use of the audiometer were selected in order that speech and pure tones could be employed as the stimuli and be presented at measurable intensities. Use of this instrument ruled out many tests designed to employ less accurate devices, such as tuning forks, rubber tubing, the Barany buzzer, etc. Those tests that result in responses that must be evaluated subjectively by the examiner were ruled out, as were those that obviously raise the question of the subject's integrity and seek to bring about admission of guilt or confusion of the subject.

Four tests were selected for the experiment, the Becker Bone Conduction, the Lombard, the Stenger-Speech, and the Stenger-Pure Tone, in order that the possibility of measuring bone conduction and air conduction thresholds might be explored. The Lombard test, the only one not relying on voluntary responses to hearing, was included because it is described in numerous articles and textbooks in otology, and apparently is used extensively.

## Subjects

Forty-five male subjects were used. Of these, 32 were volunteers from beginning speech classes at the University of Southern California, all of whom had normal hearing. The other 13 were hard of hearing men, some of whom attended lip reading classes in the Speech Clinic, while others were University students. These 45 were unfamiliar with the methods of testing and the equipment to be used. They were instructed to deny all hearing in one ear but to feel free to

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admit hearing in the opposite ear when they thought they should, and under all circumstances to do the thing that would prove total deafness in the chosen ear.

In addition to the 45 uninstructed subjects, 12 graduate students in speech correction were thoroughly instructed in the techniques of testing and in the methods of invalidating the tests. Through a series of five to eight practice sessions they became familiar with various auditory experiences, such as apparent localization and movement of sound under various conditions of the tests. They also attempted to establish thresholds that could be reproduced.

### Apparatus

Two Audio Development Company audiometers, Model 50E (**1**) were linked together by means of a junction box as shown in Figure 1. This arrangement made possible the use of one ADC phono pickup or one accessory microphone to serve as input to both audiometers, and the mixing of the output of the audiometers. This arrangement was used for the Becker Bone Conduction, the Lombard, and the Stenger-Speech tests. The signal to be presented was selected by controls on the panels of the audiometers.

Standard recorded speech was employed for the Stenger-Speech test by use of Auditory Test No. 14, Lists 5a and 5b, produced by the Psycho-Acoustic Laboratory, Harvard University.

One Sonotone audimeter, Model AE 21 (**10**), with its associated control unit was used for the Stenger-Pure Tone test only.

### Procedure and Results

Pure tone air and bone conduction audiometry preceded the battery in all cases except the final testing session with the trained subjects.

#### *The Becker Bone Conduction Test*

*Procedure*: Becker's bone conduction test (**2**) was originally devised to employ a tuning fork as the source of test tones, and an air stream for masking of the 'deaf' ear while that ear was tested by bone conduction. The rationale of the test is as follows. If the suspect is truly deaf, he will admit hearing in the opposite ear when a stimulus of sufficient intensity is presented by bone conduction to the allegedly deaf ear. The unsophisticated

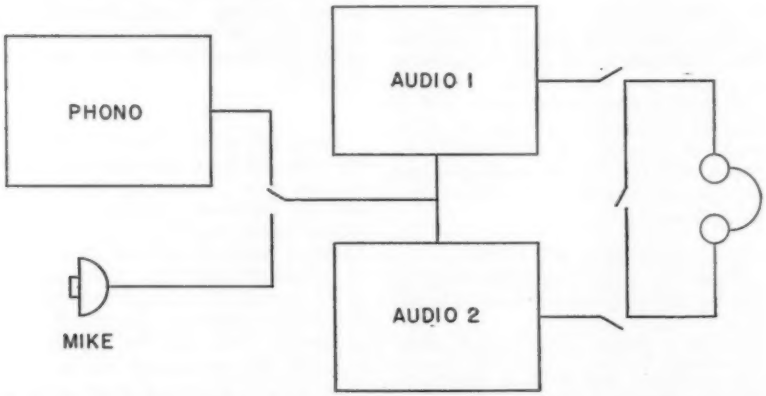


Figure 1. Block diagram showing arrangement of two audiometers to employ common phonograph or microphone input, and switching arrangement to permit the activation of either or both air conduction receivers by either audiometer.

TABLE 1. Results of the Becker Bone Conduction test showing the percentages of 45 uninstructed subjects who responded to tones presented to the allegedly deaf ear by bone conduction with various intensities of masking noise presented to that ear.

| *Frequency in c.p.s.* | *Tone Intensity in db* | *Masking Intensity in db* 0 | 10 | 20 | 30 | 40 | 50 | 60 |
|---|---|---|---|---|---|---|---|---|
| 500 | 0 | 7 | 24 | 20 | 22 | 13 | 11 | 7 |
| | 10 | 16 | 47 | 53 | 53 | 47 | 40 | 24 |
| | 20 | 13 | 53 | 64 | 64 | 62 | 53 | 49 |
| | 30 | 16 | 62 | 71 | 69 | 71 | 64 | 62 |
| | 40 | 22 | 62 | 75 | 71 | 71 | 71 | 64 |
| | 50 | 20 | 62 | 73 | 69 | 73 | 73 | 69 |
| | 60 | 16 | 55 | 68 | 69 | 71 | 73 | 76 |
| 1000 | 0 | 11 | 16 | 20 | 18 | 16 | 4 | 0 |
| | 10 | 18 | 53 | 53 | 47 | 44 | 38 | 36 |
| | 20 | 13 | 64 | 64 | 62 | 62 | 60 | 56 |
| | 30 | 13 | 69 | 73 | 69 | 64 | 73 | 69 |
| | 40 | 20 | 69 | 80 | 71 | 73 | 71 | 76 |
| | 50 | 20 | 71 | 76 | 78 | 80 | 80 | 78 |
| | 60 | 18 | 62 | 67 | 73 | 73 | 76 | 78 |
| 2000 | 0 | 9 | 11 | 7 | 7 | 2 | 0 | 0 |
| | 10 | 13 | 24 | 29 | 22 | 20 | 20 | 11 |
| | 20 | 13 | 49 | 53 | 56 | 58 | 47 | 33 |
| | 30 | 16 | 53 | 60 | 69 | 69 | 67 | 62 |
| | 40 | 18 | 58 | 62 | 69 | 76 | 71 | 71 |
| | 50 | 16 | 58 | 62 | 69 | 71 | 73 | 71 |
| | 60 | 18 | 47 | 58 | 64 | 73 | 73 | 76 |

malingerer, being unfamiliar with this phenomenon, will deny hearing when the 'deaf' ear is tested. If, however, the 'deaf' ear is masked the test stimulus will be localized in the opposite ear and admitted. Thus, failure to respond under the one condition, plus the admission of hearing under the latter condition, is interpreted as indication of malingering.

In this experiment, the air conduction receivers covered the ears of the subject and the bone conduction receiver of one ADC audiometer was placed on the mastoid process of the 'deaf' side. Test tones of 500, 1000, and 2000 c.p.s. were presented at each 10 decibel level from zero db to 60 db. Responses and failures to respond were recorded. The tones were repeated at each level, this time simultaneously with masking noise presented to the 'deaf' ear at each 10 db level from zero to 60 db so that each frequency-intensity combination of the test tone was presented in the presence of six intensities of masking noise. Responses and failures to respond were again recorded.

*Results*: The percentages of the 45 uninstructed subjects who responded to the various conditions of the test are shown in Table 1.[1]

Inspection of this table suggests that no frequency at zero db was particularly effective in that relatively few subjects admitted hearing the tone with or without masking at this level. Yet for those who failed to respond when no masking was used but did admit hearing the tone when the 'deaf' ear was masked, the test was most appropriate at this level. It is seen that the higher intensities of tone and masking noise were generally most effective in detecting malingering. It

[1]Results for the instructed subjects on all tests will be treated together as a separate section of the article.

should be observed, however, that the lowest intensity to which a subject responded more nearly approximated his true threshold for the tone than did the higher intensities.

The effectiveness of the principle of the test is measured in part by comparing the percentage of subjects who responded to a given tone and intensity when no masking was used with the percentage who responded to the same tone and intensity when masking was used. Differences great enough to be significant at the one per cent level may be found at those positions in the table where a percentage shown under masking at 10 to 60 db is 29 greater that that shown in the same row under masking at zero. The masking noise apparently was highly effective in simulating deafness for the subject under those conditions where such differences appear.

The effect of excessive masking noise is observed when the percentages opposite the lower intensities of tone are noted. It appears that as the masking noise became great the function of the test was destroyed in some instances, and that the test was most successful when the masking intensity was nearer that of the tone used.

Statistical treatment of the data is not adequate for a complete evaluation of the test. No untrained normal hearing subject invalidated the test in its entirety, although one responded to all levels of two of the tones when no masking was used, and another failed to respond at all to any of the conditions for one tone. The test was appropriate for another only when the intensities of the tones were 30 db or less. Some subjects failed to respond consistently after having responded while the masking noise was presented.

The hard-of-hearing subjects who feigned deafness in the poorer ear heard the tones in the better ear without masking to the deaf ear. Two who elected to prove deafness in the better ear consistently failed to respond to any of the conditions of the test. For those subjects with equal losses in both ears the results were similar to those obtained from those with normal hearing.

Because some subjects responded when no masking was used it is evident that it was unsafe to regard a response under this condition as an indication either of hearing or lack of hearing in the ear under test. The only result that could indicate malingering was the failure to respond when no masking was used, providing the subject did respond when the tested ear was masked.

### *The Lombard Test*

*Procedure*: The Lombard test (**6**) was second in order in this experiment. That one unwittingly increases the loudness of his voice when he is unable to hear it because of deafness or because of the masking effect of environmental noise is the principle on which this test is based.

The masking noise from one audiometer was delivered through either receiver so that either ear could be masked, as in the traditional administration of the test, or through both receivers so that both ears could be masked simultaneously, a step suggested by Harbert (**7**).

In the administration of the test, the air conduction receivers remained in place over the ears of the subject. Instructions to start reading aloud from a factual article taken from a popular magazine were given. As the reading started, the microphone was adjusted to a position on the tablet arm of the subject's chair to a point where voice peaks showed clearly on the monitoring meter of the audiometer. The subject was instructed to keep the mouth-to-microphone distance constant. The hearing loss dials of the audiometers were adjusted to a reading of minus 10 db to prevent the subject from hearing his own voice through the receivers. Reading con-

TABLE 2. Voice peaks observed when 45 uninstructed subjects were tested by use of the Lombard test.

| | *Masking in db* | *Range of Peaks* | M | $\sigma$ | $\sigma_M$ |
|---|---|---|---|---|---|
| *Deaf Ear Masked* | 10 | 0 – 4 | .60 | 1.533 | .2311 |
| | 20 | 0 – 6 | 1.17 | 1.449 | .2184 |
| | 40 | 0 – 8 | 2.22 | 1.848 | .2786 |
| | 60 | 0 – 10 | 3.62 | 2.461 | .3710 |
| *Good Ear Masked* | 10 | 0 – 5 | .60 | 1.136 | .1712 |
| | 20 | 0 – 6 | 1.35 | 1.595 | .2404 |
| | 40 | 0 – 8 | 2.77 | 2.096 | .3159 |
| | 60 | 0 – 10 | 4.13 | 2.446 | .3687 |
| *Both Ears Masked* | 10 | 0 – 6 | 1.55 | 1.938 | .2921 |
| | 20 | –1 to 8 | 3.26 | 2.439 | .3677 |
| | 40 | 0 – 11 | 6.11 | 2.592 | .3907 |
| | 60 | –3 to 14 | 8.00 | 3.293 | .4964 |

tinued without disturbance until maximum voice peaks, as noted by deflections of the needle of the monitoring meter became uniform. Masking was introduced into the receiver over the allegedly deaf ear at consecutive levels of 10, 20, 40 and 60 db. Voice peaks observed at each level were recorded. These masking intensities were next presented to the good ear alone, then to both ears simultaneously, and voice peaks were recorded for each level. Thus, it was possible to observe the voice intensities under four conditionss: reading without disturbance; reading with the allegedly deaf ear masked; reading with the good ear masked; reading with both ears masked.

*Results*: The results of this test for the 45 uninstructed subjects are shown in Table 2. The measurement of voice increases for each individual case was from the peaks observed as the subject read without masking to either ear. The table shows the range of increases in decibels; the other statistics are derived from these ranges.

That the lower intensities, 10 and 20 db, produced some observable increase is of interest. It should be pointed out that the examiner was not confident of his judgment concerning these increases. They were small enough in all cases that it could not be said that recorded increases were perceived.

The minus numbers in the ranges shown under 20 and 60 db when both ears were masked are accounted for by the performance of one normal hearing subject. Apparently in an attempt to control his voice, he permitted his speech to become fainter rather than louder as the noise increased.

The similarity between the increases noted when the 'deaf' ear and the good ear were masked separately is apparent. There are no significant differences at any level of masking.

TABLE 3. Comparison of voice peaks observed under various conditions of masking in the Lombard test. (N=45)

| *Intensity of Masking* | *Difference Between Masking of Good Ear and Deaf Ear* | | | *Difference Between Masking of Good Ear and Both Ears* | | |
|---|---|---|---|---|---|---|
| | $D_M$ | $\sigma_{d_M}$ | *t* | $D_M$ | $\sigma_{d_M}$ | *t* |
| 10 | .00 | .2875 | ——— | .95 | .3385 | 2.8064 |
| 20 | .18 | .3382 | .5322 | 1.91 | .4393 | 4.3478 |
| 40 | .55 | .4212 | 1.3057 | 3.34 | .5024 | 6.6480 |
| 60 | .51 | .5230 | .0975 | 3.86 | .6183 | 6.2429 |

This result tends to substantiate the usual interpretation of the test.

It is important, however, to compare the data obtained for masking of the good ear alone with that obtained for masking of both ears simultaneously as shown in Table 3. When this is done, the *t* ratios obtained exceed the ratio required for the one per cent level at each masking intensity level. This result indicates that both ears must be masked simultaneously in order to make the test complete.

The responses of one subject with true unilateral deafness are of interest. Voice increases noted when both ears were masked were equal to those noted when the good ear alone was masked, but there was no increase when masking was delivered to the deaf ear alone. The increases were of the order of three db, however, and the examiner could not be confident of a judgment regarding the increase.

### *The Stenger-Speech Test*

*Procedure*: Third in order of presentation was the Stenger-Speech test. This was a modification of the original Stenger test (8) to employ speech as the stimulus. This test is based on the following observation. When two stimuli that are alike in all respects except intensity are presented to the two ears of a normal hearing subject separately but simultaneously, and if there is sufficient difference between the intensities of the two stimuli, the subject will be unaware of stimulation in the ear to which the lesser stimulus is presented. When, on the other hand, the malingerer is confronted with this situation, and where localization is definite to the allegedly deaf ear, he will deny hearing even though the opposite ear is stimulated at a level above threshold. Failure to admit hearing in the good ear at a level previously established while the 'deaf' ear is stimulated is interpreted as indication of malingering.

This adaption employed speech as the stimulus presented over a wide range of intensities in order to explore the degree of the success of the principle, and to determine whether a threshold for speech for an ear alleged to be deaf could be described by this method.

To present speech at variable intensities to the two ears separately and simultaneously, two ADC audiometers were used. The right receiver was served by one audiometer and the left receiver by the other instrument. The output of the ADC accessory phono pickup was split so that both instruments were fed identical speech signals. The two audiometers and receivers were sufficiently well matched that normal hearing persons used to check the calibrations of the arrangement could not localize the sound of the words to either ear when the Hearing Loss dials were set at equal levels. Before each subject was tested, the output of the phono pickup was calibrated so that the 1000 cycle tone

recorded with the word lists caused deflection of the needle of the monitoring meter to zero db. When calibrated in this manner, a reading of zero db on the Hearing Loss dial of the audiometer is equivalent to normal threshold for the words.

Subjects were instructed to continue to feign deafness in the chosen ear and to repeat all words they could or thought they should in order to prove unilateral deafness.

The words were presented first to the 'deaf' ear at a range of intensities up to 85 db in order to determine that the subject still feigned deafness, then the threshold was found for the good ear. The words were next presented to the good ear at consecutive levels of five, 10, 20, 40, and 60 db. As each level was presented, the words were delivered to the 'deaf' ear at greater intensity than that to the good ear. The intensity to the good ear was undisturbed at the selected level, but that to the 'deaf' ear was attenuated by steps of five db, allowing two words to be presented at each level, until the subject began to repeat the words. The lowest intensity to the 'deaf' ear at which the subject was still unable to repeat the words was recorded as the intensity sufficient to mask the words in the good ear.

*Results*: The results of the Stenger-Speech test for the 45 untrained subjects are shown in Table 4. The number of subjects who responded to speech presented to the good ear at each level is shown in the second column.

The range of intensities to the 'deaf' ear necessary to mask the hearing in the good ear is of interest. Some subjects failed to respond until the intensity of the words presented to the 'deaf' ear was below that to the good ear. This occurred with the normal hearing and hard-of-hearing subjects. It is significant that the difference between the intensities to the two ears had to be as great as 40 db, as it was when 40 db was presented to the good ear, and as great as 35 db when 60 db was presented to the good ear.

The response of the one subject with true unilateral deafness is of interest at this point. Under no condition was the hearing in the good ear masked. Rather, when the words were presented to the deaf ear at 65 db, those that were presented to the good ear appeared to become louder. Threshold for the good ear with only the receiver on the deaf side activated was 65 db. This suggests that any subject with normal hearing could have invalidated the test by repeating the words when the intensity of the 'deaf' ear was 65 db or more.

The mean of the intensities to the 'deaf' ear sufficient to mask the good ear tend to indicate that as greater intensities were used in the good ear it became necessary to increase the difference in intensities between the two ears before masking was successfully achieved. The standard deviations and standard errors of the means suggest that there was less spread in the responses at the higher levels. One might suppose that the subjects could remain aware of stimulation of the

TABLE 4. Intensity of speech to deaf ear sufficient to mask speech to good ear when 45 uninstructed subjects were tested by the Stenger-Speech test.

| *Speech to Good Ear (in db)* | N | *Range* | M | $\sigma$ | $\sigma_M$ |
|---|---|---|---|---|---|
| 5 | 25 | 0–25 | 9.2 | 5.65 | 1.15 |
| 10 | 32 | 5–30 | 16.4 | 6.14 | 1.10 |
| 20 | 36 | 10–45 | 27.4 | 7.93 | 1.34 |
| 40 | 38 | 15–80 | 48.3 | 5.98 | .98 |
| 60 | 43 | 40–95 | 69.4 | 5.14 | .79 |

good ear easier at the higher levels that at the lower levels, and that the test, therefore, was more secure when minimum intensities to the good ear were used.

*The Stenger-Pure Tone Test*

*Procedure*: The Stenger-Pure Tone test (**8, 9**) was last in the battery of tests used in the experiment. The original Stenger test employs two matched tuning forks to present identical stimuli to the two ears separately. The distance at which one activated fork can be heard by the good ear is measured, then the second activated fork is held near the allegedly deaf ear. The hearing distance for the good ear is supposedly unaffected by the stimulation of the opposite ear, if the suspect is truly deaf, but the original hearing distance is shortened markedly if the suspect does hear in the allegedly deaf ear. Thus, the decrease in hearing distance is taken as indication of malingering.

This adaptation was designed to explore the effectiveness of the principle by presenting three tones at 500, 1000, and 2000 c.p.s, over a wide range of intensities. In addition, the possibility of plotting a complete air conduction audiogram as suggested by Fowler (**5**) was investigated when the trained subjects were tested in their final sessions.

The Sonotone audiometer Model AE 21 with its associated Control Unit was used to present the tones at selected intensities to the good ear and at variable intensities to the 'deaf' ear. Each frequency, 500, 1000, and 2000 c.p.s., was presented to the good ear at five, 10, 20, 40 and 60 db. Since the hard-of-hearing subjects could not hear the lower intensities, the range used with this group extended to the maximum limit of the audiometer when necessary. As each level was presented, the tone was introduced into the 'deaf' ear at a level below normal threshold and attenuation was slowly removed until the subject stopped signaling that the tone was heard. The level at which the tone was presented when this occurred was recorded as the intensity of the tone to the 'deaf' ear sufficient to mask the same tone in the good ear.

In applying the principle of the test when plotting an audiogram for the allegedly deaf ear for the trained subjects, the good ear was stimulated at 15 db above threshold for that ear at each octave interval from 125 to 800 c.p.s. The intensity of the same tone to the 'deaf' ear was varied at each frequency from below threshold to maximum and down until a consistent response was found, or discrete stimuli at unequal intensities were presented to the two ears by interrupting the tone. The intensity to the 'deaf' ear sufficient to mask the good ear was recorded. Because the tone to the good ear was 15 db above threshold for that ear, a correction factor of 15 db was subtracted from the value recorded for the 'deaf' ear, since it could be assumed that the tone to the 'deaf' ear sounded at least as loud in that ear as the tone in the good ear.

*Results*: The results of the Stenger-Pure Tone test are shown in Table 5. Only the results for the 32 normal hearing uninstructed subjects are shown. It will be observed in the table that in only one instance is the total number of normal hearing subjects shown. Some subjects failed to respond to stimulation of the good ear, particularly at the lower intensities, when the 'deaf' ear was undisturbed, while others continued to signal that the tones were heard in the good ear in the presence of high intensities in the 'deaf' ear. Those who failed to respond presented higher than normal thresholds for the good ear in an attempt to simplify their problem. Those who continued to signal that the tone was heard invalidated the test under some conditions, but none succeeded under all conditions of the test. The test was effective for one individual only when 500 and 1000 c.p.s. were presented to the good ear

TABLE 5. Intensity of tones to deaf ear sufficient to mask good ear when 32 uninstructed normal hearing subjects were tested by the Stenger-Pure Tone test.

| *Tone to Good Ear (in db.)* | | 500 | | 1000 | | 2000 | 500–2000 |
|---|---|---|---|---|---|---|---|
| | *Range* | −5 to 30 | | 0 to 45 | | −5 to 35 | |
| | N | 26 | | 30 | | 24 | |
| | M | 10.9 | | 14.8 | | 14.1 | |
| 10 | $\sigma$ | 10.636 | | 10.672 | | 9.949 | |
| | $\sigma$M | 2.12 | | 1.98 | | 2.07 | |
| | $\sigma$dM | | 2.90 | | 2.96 | | 2.96 |
| | DM | | 3.9 | | .7 | | 3.2 |
| | $t$ | | 1.33 | | .23 | | 1.08 |
| | *Range* | 0 to 45 | | 10 to 40 | | 10 to 45 | |
| | N | 32 | | 30 | | 29 | |
| | M | 21.8 | | 22.5 | | 25.8 | |
| 20 | $\sigma$ | 9.565 | | 6.667 | | 7.193 | |
| | $\sigma$M | 1.71 | | 1.23 | | 1.35 | |
| | $\sigma$dM | | 2.10 | | 1.82 | | 3.98 |
| | DM | | .625 | | 3.36 | | 2.17 |
| | $t$ | | .29 | | 1.84 | | 1.83 |
| | *Range* | 20 to 75 | | 25 to 55 | | 30 to 75 | |
| | N | 31 | | 30 | | 29 | |
| | M | 39.6 | | 41.6 | | 45.8 | |
| 40 | $\sigma$ | 11.404 | | 7.589 | | 9.720 | |
| | $\sigma$M | 2.08 | | 1.41 | | 1.83 | |
| | $\sigma$dM | | 2.50 | | 2.30 | | 2.77 |
| | DM | | 1.9 | | 4.19 | | 6.2 |
| | $t$ | | .79 | | 1.82 | | *2.23 |
| | *Range* | 35 to 80 | | 45 to 70 | | 45 to 90 | |
| | N | 29 | | 29 | | 27 | |
| | M | 57.9 | | 60.0 | | 64.6 | |
| 60 | $\sigma$ | 10.602 | | 6.806 | | 10.345 | |
| | $\sigma$M | 2.00 | | 1.28 | | 2.02 | |
| | $\sigma$dM | | 2.37 | | 2.39 | | 2.84 |
| | DM | | 2.1 | | 4.6 | | 6.7 |
| | $t$ | | .87 | | 1.93 | | *2.35 |

* Significant at the five per cent level.

at 10 and 20 db. No other subject of this group came so near to success in demonstrating total loss. Since this was the last test in the series, it is possible that the subjects had gained some insight into the principle of the test.

The data shown in Table 5 are treated on the basis of the number of subjects who admitted that the tones were heard in the good ear without stimulation of the 'deaf' ear minus those who invalidated the test under some conditions.

The statistic of greatest importance is the range of intensities of tones to the 'deaf' ear sufficient to mask the tone to the good ear. Some subjects indicated that the tones were no longer heard in the good ear when the intensity of the same tone to the 'deaf' ear was well below that to the good ear. It will be noted also that the intensity to the 'deaf' ear had to be as much as 35 db greater than that to the good ear with 500 and 2000 c.p.s. at 40 db before some subjects stopped indicating that the tone was heard in the good ear.

Inspection of the means of the in-

tensities required for successful masking suggests that, in general, greater differences between the intensities of the two tones were required at higher frequencies, but this observation is not supported by other statistics. Tests for significant differences between means revealed only two differences that were great enough to be significant at the five per cent level. These differences are shown by the *t* ratios derived by comparison of the means at 500 and 2000 c.p.s. when 40 and 60 db were presented. That the mean intensity to the 'deaf' ear was significantly greater when the 2000 cycle tone was presented at each of these levels than the mean obtained when the 500 cycle tone was presented may be the result either of possible greater effectiveness of the lower frequency or of increased familiarity and boldness on the part of the subjects as the test progressed. It is evident that the security of the test was best when lower intensities were used. It is evident, also, that all frequencies used were effective, except in one instance, as noted above.

In general, the results with the hard-of-hearing subjects indicated that the intensities to the 'deaf' ear had to be equal to or greater than the intensities to the good ear to achieve successful masking. From those subjects for whom the test was appropriate a total of 143 responses indicating malingering were obtained. Of this total 54, or 38 per cent, were obtained when the intensity to the 'deaf' ear was less than that to the good ear. This was due in part to the fact that two subjects who elected to feign deafness in their poorer ears consistently responded in this way.

Masking occurred when intensities to the 'deaf' ear were as much as 30 db below to 60 db above the intensities used to the good ear with the hard-of-hearing subjects.

Tones at 1000 and 2000 c.p.s. presented to the good ear of the subject with true unilateral deafness were made louder in the good ear by presenting the same frequencies to the deaf ear at 70 and 75 db.

*Results, Instructed Subjects*

It will be recalled that 12 subjects were instructed in the principles and techniques of the tests and practiced methods of demonstrating true deafness. The results obtained in the final testing sessions with these subjects are described below.

*Becker Bone Conduction Test*: Routine administration of this test was ineffective with the instructed subjects. Presentation of random combinations of masking and tone intensities, however, destroyed pre-established thresholds. Masking of the good ear while these random combinations were presented to the 'deaf' ear was highly effective in destroying the thresholds.

*Lombard Test*: The Lombard test was invalidated by trained subjects. Seven succeeded in reading at a constant level under all conditions of the test, thus producing a negative result that could not be interpreted as indication of normal hearing, of malingering, or of true deafness. One was successful in producing equal increases when the good ear was masked alone and when both were masked simultaneously. The objective indications suggested that it was difficult for the practiced subjects to produce increases when the good ear was masked equal to those produced when both were masked, but the judgment of the examiner was not reliable in detecting the differences recorded.

*Stenger-Speech Test*: Some trained subjects resorted to guessing in the final testing sessions, while others attempted to rely on the sensations recognized in practice sessions. In each case, inconsistent responses were given. Examples of these responses serve to illustrate the value of the practice.

One subject responded consistently when the words were presented to the good ear at 20 db while the intensity

TABLE 6. Difference in db at each frequency between the threshold obtained for the deaf ear and the intensity at which the good ear was stimulated in plotting threshold audiogram by the Stenger principle for each of seven trained subjects. (X indicates that maximum intensity to deaf ear was ineffective.)

| *Subject* | *Difference in db at all frequencies* | | | | | | |
|---|---|---|---|---|---|---|---|
| | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
| A | 0 | 0 | 0 | 20 | 25 | 35 | 10 |
| B | 0 | 5 | 15 | 15 | 25 | 0 | 15 |
| C | 15 | 15 | −10 | 0 | 10 | 15 | 0 |
| D | 0 | 20 | 5 | 5 | 5 | 0 | 5 |
| E | −5 | −5 | 10 | 15 | 45 | 40 | X |
| F | 5 | 20 | 55 | 30 | 15 | 30 | 45 |
| G | 10 | 5 | 45 | 55 | X | X | 35 |

was increased to 45 db to the 'deaf' ear, 45 db being the maximum level at which he could recognize the presence of the words to the good ear at 20 db. When the words were presented to both ears at 25 db, however, he continued to repeat the words although the intensity to the good ear had been reduced to minus 10 db, which was below his true threshold for the good ear. The 'deaf' ear threshold for speech was thus established at 25 db.

Another subject did not respond to speech to the 'deaf' ear at 70 db and the words were introduced gradually into the good ear. This subject began to repeat the words when they reached a level of 55 db in the good ear. It would be reasonable to assume that the true difference between the thresholds for the two ears in this instance was no greater than 15 db. The threshold previously determined for the good ear was zero db.

A third subject responded when the words were presented to the 'deaf' ear alone at 65 db, as did the subject with true unilateral deafness. This threshold was reduced to 35 db, however, by introducing and removing the words at variable intensities to the good ear. He was unable to detect the absence of the words on the opposite side when those to the 'deaf' ear were presented at 35 db.

No subject of this group found a means of invalidating the test, although numerous variations in the routine testing procedures were employed in practice sessions.

For each subject, the threshold for speech for the 'deaf' ear was considered to be no higher than the level required to mask the good ear when that ear was stimulated at a minimum intensity above threshold. Exaggerated thresholds were obtained.

*Stenger-Pure Tone Test*: When administered in the routine manner, this test was readily invalidated. Knowledge of the method was sufficient, Variations in the administration of the test, however, were effective in proving malingering in every instance.

Effective variations were as follows: The tone was presented first to the good ear at a level well above threshold while the intensity to the 'deaf' ear was increased. As the two intensities became equal, that to the good ear was reduced gradually to a subthreshold level while that to the 'deaf' ear was increased. Leaving the tone at the constant level in the 'deaf' while increasing the intensity to the good ear was also effective. Repetition of this technique with different intensities to the 'deaf' ear on each repetition produced variable thresholds in the good ear. Stimulation of the 'deaf' ear by alternately increasing and decreasing the intensity between 30 and 50 db was most effective in producing inconsistent thresholds for the good ear.

No subject in this group was suc-

cessful in demonstrating total loss of hearing, and none could present consistent thresholds for the good ear when variations in the testing procedure were employed. Recognition of two pitches did not assist those who experienced diplacusis.

The plotting of an audiogram for the 'deaf' ear by application of the principle of the test was successful in five cases in that the curves plotted for the 'deaf' ears were equal to or did not differ by more than five db from the threshold curves plotted for the good ear. Seven of the 12, however, succeeded in presenting exaggerated thresholds, as shown in Table 6. The threshold values obtained for the 'deaf' ears at each frequency are shown for these seven. Total losses were presented by Subject E at 8000 c.p.s., and by Subject G at 2000 and 4000 c.p.s.

The results of the Stenger-Pure Tone test indicate that the principle on which the test is based can effectively be applied to detect malingering, providing several frequencies are used. They indicate further, that an audiogram can be plotted for an ear falsely claimed to be deaf, although the thresholds obtained may be exaggerated.

## Summary

Four tests for detection of feigned unilateral deafness were administered by use of audiometers. These were the Becker Bone Conduction, Stenger-Speech, Stenger-Pure Tone, and the Lombard tests. It was found that all were generally useful in detecting malingering. It was also found that approximate bone conduction thresholds for pure tones, and approximate thresholds for speech and pure tones could be established. No test, however, was completely appropriate for all individuals.

The Lombard test was the only one of the four that was completely invalidated by any subject, and the only one that could not be used to measure the nature and extent of the alleged loss.

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# Home Training for Preschool Deaf Children Through Correspondence

Harriet Andrews Montague*

THE sudden awareness of a severe hearing loss in a young child is a shattering blow to his parents. Very often it is the first case of deafness with which they have had contact, and they are bewildered by the implications of the problem. Their attitude and the practical measures they adopt to offset the handicap may mean a great deal to the child's whole future.

The parental attitude may reveal itself in one of several trends: (1) there may be a complete refusal to accept the fact of deafness, and for months the child may be taken from otologist to otologist in the effort to find a cure; (2) finally convinced that the handicap is permanent, the parents may adopt an attitude of extreme pity and begin sheltering and over-protecting the child, doing him great harm; or (3) in rejecting the idea of deafness, they may reject the child, and fail to give him the love, understanding, and continuous help that he needs.

The difficulty in the way of communication is baffling to both child and parent, and may frustrate both unless something is done about it as soon as possible. Without enough outlet for his energies, and without language to express himself, the small deaf child is apt to develop troublesome behavior problems that may reach the extremes of temper tantrums, head pounding, screaming, and running about the house at night. Even when the manifestations are not so severe, much of the child's energy is wasted because nobody in the family knows how to channel it to constructive ends.

All of these harmful reactions may be corrected, to the great benefit of the whole family, if the parents have access to reliable sources of information, and are willing to apply what they learn. They are much in need of detailed advice from someone who is familiar with the problems that deafness entails and with the effect that deafness has on the individual and his adjustment to life. If they have access to a 'hearing center' or a school for the deaf that provides for clinical advice, they may obtain some of this help directly; but usually they are far from such sources of information, and must apply for help by mail.

During the past six years, the John Tracy Clinic of Los Angeles has been sending a correspondence course, on request, to parents of young deaf children throughout the world. More than 2,000 families have had all or part of the course, and over 500 are currently enrolled. They are located in 16 different countries and are using the course in eight different languages, the parents themselves doing the translating or having it done.

The course provides training for both parent and child. It covers a year's work, and includes the first lessons in lip reading, language, sense training, acoustic training, and speech

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preparation. It is sent in 12 mimeographed installments, and the parents are expected to do the work indicated and report monthly to the clinic. All reports are handled personally and individually, and personal letters are written offering suggestions and encouragement, an approach which is very necessary as the children range from 20 months to five years of age.

As a rule, the children have had no instruction previous to being offered the lessons of the course, so the introductory lessons may be given to the older ones as well as to the babies. In the case of very young children, under two, particular suggestions are given in relation to the child's age; and with older children the lessons are accelerated, or additional material is supplied, as, for instance, exercises in word recognition as preparation for reading readiness.

Succeeding installments include simple matching exercises: the matching of objects, the matching of colors, the matching of an object to a picture, the matching of a picture to a picture, the matching of an object or a picture to the spoken word. This leads to the beginning of speech reading. The parents learn that it is possible to teach even a very young deaf child to understand spoken words. This often is a revelation to them, and gives them new hope. They have a means of communication and a definite program to follow.

Games are offered to help make this early instruction interesting to the child. Suggestions are given as to material that may be made or purchased—charts, picture sets, picture lotto, wooden puzzles, wooden insets, colored blocks, etc.—not as toys to play with, but material to afford the child what he needs more than anything else, *interesting things to do*, things to achieve, things to give him the experience of success.

A mother in Pennsylvania who has completed the course expresses this succinctly in evaluating what the lessons have meant to her and her child:

> Perhaps the most important thing I have gained is the realization that a busy child is a happy child, whether deaf or hearing. Most of the exercises that you suggested have been such fun to do that learning seems almost a by-product.... There is such an important, almost smug, air about Stevie when he does well some task I've given him, he is so pleased with his success, that it makes both of us proud and happy.

The parents are told again and again that this 'work' must be offered as play, and that the child must enjoy it. Always they are cautioned against being impatient for results. Many of the mothers name 'patience' as the first lesson they learn. The whole procedure of conducting the course is flexible and informal, and every effort is made to adapt the suggestions to the individual needs of both child and parent. All the parents need information on the problems of deafness, and several of the installments are partly made up of discussions of attitudes and the child's need of special understanding. Suggestions are made as to specific behavior problems: eating, sleeping, toileting, temper tantrums, etc.

None of the suggestions are technical or intricate, although they are in line with correct educational procedure. Acoustic exercises are begun early; the parents are encouraged to talk and sing quietly close to the child's ear, to teach him to notice and differentiate gross sounds, to experiment with earphones attached to the radio. Rhythm games are introduced, and imitative play to increase muscular coordination. Material for number work is suggested and the rhythm of counting numbers from one to five. Most of the lessons are devoted to the building up of a knowledge of language through lip reading and the use of pictures and games.

Suggestions and comments from other parents are quoted in the text, so that the parents who are using the lessons come to realize they are not

alone in their problem. The following extracts from letters received give some idea as to results obtained:

A mother in Washington: Laurie's most exciting accomplishment of the month is her nearly doubling her lip reading vocabulary. In addition to the 15 words that she could understand when I last wrote, she now knows: *eye, mouth, ear, fingers, spoon, hot, top, toilet, mamma, car, up, sit down, clap your hands.* I wish all mothers of little deaf children could realize the value of constantly talking to them.

A mother in New Hampshire: I think your course helped me the most by making me accept the fact of Michael's deafness. Once I got used to the idea that his deafness is not entirely a calamity, I did not think of it as so much of a problem. . . . . I can see how the various forms of comparison—the picture and object and color matching—have helped to prepare him for lip reading and speech.

A mother in South Dakota: I almost wish my oldest child had been deaf instead of my seventh. I believe I would have been a better mother all along the line. I find many things in the course that I can use with the other children. For instance, the suggestion to take time out each day to *think* about your child is so good that I use it with the whole family, and with wonderful results.

A mother in Wisconsin: Eddie and I have both learned to relax. We both feel much more at ease with each other, and he is much more manageable. He was so very destructive, but now he is able to play quietly for long periods, and he has many things he likes to do by himself.

A mother in Michigan: In one of your installments, it says to "think about your child." Well, I had thought about her almost constantly, but mostly it was worry, or despair, or disappointment. Then I began to think about her actions. I wondered what it was that made her so mean. She would do things just to get punished, it seemed. Everything would be going smoothly, and then for no apparent reason she would take off her shoes and throw them, and kick, or go into a tantrum, which I would ignore for a time, and then when I could not stand it any longer, I would punish her. Then I began to think and take note of when these actions would occur, and I realized that they happened mostly when I sat down to play with her brother or read to him or otherwise gave him attention, leaving her to her own devices. So, instead of punishing her for knocking over the lamp or tearing the curtains, I would sit down and hold her, wash off her face and give her a lesson (she loves her lessons) or just look at a book with her. After I had paid some special attention to her, she did not mind the attention I paid to her brother. And now she is almost completely over the tantrums.

A mother in Illinois: A year ago, Lynn was a baby of almost two, a "baby" in more than just her age, for we all treated her as a child of one. It's funny how the lack of speech can make you regard a child as much younger than she is, and even though you know better you continue to do things for her that she should be doing for herself. Temper tantrums were frequent, but we explained them by saying, "she just doesn't understand," without making an effort to get her to understand, or, better still, understand her. . . . . Today Lynn has started to school, and I am proud to say she is as socially mature, as happy and as mentally alert as any three year old. . . A year ago, the matter of adjustment was a prime necessity to us as parents, and it is this that I would place first in the things of importance that we learned from your course.

There are hundreds of letters like this in the clinic files to give evidence of the value the lessons have in improving the home situation. But what of the school progress of the child, after the home training gives place to formal instruction? Is the child's school progress accelerated to any appreciable degree by this preliminary work? Is his social adjustment improved? Does he carry over into the school situation the results of the lessons he has learned? In a good majority of cases, the answer is yes. One noticeable result is that the child is more ready for formal speech teaching. He has a command of language which, even though still limited, has prepared him to understand the reason for speech and to want to talk. In many cases he has already begun to babble and even to say words. The informal practice in listening to sounds that he has had has prepared him for the use of the group hearing aid, if this is indicated. Some children have

even begun to build up a hearing vocabulary. Most important, probably, is the child's ability to cooperate and to adjust himself to situations. School reports have shown this to be true in many cases.

For instance, a boy of three years, eight months had completed the course before entering a residential school in New York City. His mother, a former teacher, had worked with him very intelligently. He was placed in the nursery group, but after a week was promoted to the preschool class. His mother wrote:

> He is ready to start immediately on speech work. Mrs. R. found it difficult to believe at first that he had not had some formal schooling prior to his enrollment, and she has said that, for the record, she would want me to tell how I had gone about his work at home.

A four year old, after completing the course, entered a resident school in Massachusetts. Her mother reports:

> Her teacher tells me she was able to begin speech work almost at once, as the lessons in concentration Elaine had learned from the course eliminated the need to play games in order to teach Elaine to watch and pay attention. Also, I had been doing acoustic work for months, and the teacher was able to go right ahead with that.

Not all of the parents have done equally well with the lessons, and not all of them complete the course. About 65 per cent of those who enroll complete it; about 75 per cent finish at least the first six installments, with varying benefit. It is safe to say that all those who work with it conscientiously and intelligently, without attempting to force the child, achieve noticeably good results.

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EDITOR'S NOTE: The Editorial Office has recently received from the Business Manager a complete file of unbound issues of the *Journal*. As we studied these issues we observed that the very first number, under the editorship of Dr. G. Oscar Russell, carried on its cover the following:

> Devoted
> to scientific research concerning,
> and to improvement of, humanity's
> Speech, Voice, and Hearing
> processes.

The Association has recently changed its name and the name of its official publication in order to acknowledge activities of its members in the field of hearing. It is in the process of revising its membership classification in order more specifically to recognize interest and competence in this field, and in general research as well. The above statement has, then, peculiar historic significance as the Association prepares to enter its second quarter-century of life.

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# Personality Characteristics and Emotional Problems in Stutterers under the Age of Five

Philip J. Glasner*

THE observations here summarized were made in the examination and treatment of 70 stutterers under the age of five, most of whom were referred by physicians. In each instance, a detailed case history was obtained from the parents, and a careful appraisal of the child's personality was made by direct study during personal interviews. In most of the cases, the author's observations and findings were supplemented and correlated with examinations made by other members of the staff of the Children's Psychiatric Service at the Johns Hopkins Hospital. Of the group studied, the youngest was two years two months, and the oldest four years 11 months. The average age, as well as median age, was three years six months. The children were evenly divided in the three age groups: two to three, three to four, and four to five.

These children were referred to the author for diagnosis and treatment because of abnormal speech. In most cases the repetitions, prolongations, or blocking of sounds were in various ways different from the familiar repetitions and stumblings of children. Their speech was characterized by a change in muscle tonus, pitch, speed, and rhythm. This difference, in most cases, was observed by the physicians, usually pediatricians. One mother, who had been a nursery school teacher, said of her two year 10 month old child, 'All children repeat at times in their speech, but hers is different from any I've ever heard. She is so tense when she speaks.' As a rule, there was an element of tension and compulsion in their speech which distinguished them from other children. Such children cannot be passed off lightly as merely being in the so-called 'primary stuttering' stage when speech is simply to be ignored. Rather, it must be recognized that some emotional disturbance has disrupted their normal pattern of speech.

The attitude of these children toward their speech was extremely difficult to determine since the problem was never openly discussed by the therapist. While it is true that young children do not have the deeply rooted speech fears and situational anxieties characteristic of adult stutterers, there was evidence that some anxiety and consciousness did exist. Some of these children, whose attention had apparently not been directed to their speech, after a prolonged repetition or block would blurt out or whisper, 'I can't talk.' Some showed their frustration by crying, others by stamping their feet or walking away without completing their sentence. Some placed their hands over their mouths whenever they were about to stutter. Two had been known to avoid speech for a period of two days. Obviously, many of these children were disturbed or anxious while stuttering, but whether this is the cause or the effect of the stuttering cannot readily be de-

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termined.] The only thing that can be said with certainty is that many children under five when stuttering *do not* exhibit the same calm, totally unconcerned attitude characteristic of normal children when they speak with usual childhood repetitions and speech inaccuracies.

All of the children studied had exhibited some degree of emotional manifestation other than stuttering. Fifty-four per cent were characterized as 'feeding problems.' Twenty-seven per cent were enuretic. Twenty per cent had exaggerated fears or nightmares. These percentages are, of course, not exclusive; over half of the children studied showed two or three other indications of emotional disturbance. Other symptoms in smaller percentages were thumb sucking, exaggerated sibling jealousy, nail biting, encopresis, masturbation, emotional vomiting, and numerous others. It is realized, of course, that the 'normal' child is a fiction, not a reality, but these children apparently had more than their share of behavior symptoms.

The characterization of the child by the mother while, of course, not scientific, is also indicative of the general characteristics of very young stutterers. Thirty-three per cent were described as 'sensitive' or 'nervous.' Other descriptions in smaller percentages were 'timid,' 'shy,' 'highstrung,' 'stubborn,' 'unsocial,' 'excitable,' 'restless,' 'tense.' These adjectives used by parents are, of course, merely terms used by laymen to indicate that their children are somehow emotionally upset. The author's clinical findings, however, corroborate these non-scientific and instinctive opinions of the parents. In a study of students at the college level (**1**), Bender found that stutterers were 'more neurotic, more introverted, less dominant, less confident in themselves, and less sociable.' These same traits were found to a lesser degree by the author in stuttering children under the age of five.

It is impossible to give a complete list of the disturbing conditions which produce stuttering, because new factors constantly come to the attention of the speech therapist. In a previous paper (**2**), the author discussed a number of emotional problems and environmental factors found to produce stuttering. Further clinical experience supports the view that *any* condition or situation which produces fairly constant emotional disturbances in a child may produce a change in the speech pattern. It is therefore not believed that there is any specific 'typical stuttering environment.' No type or degree of environmental disturbance necessarily produces stuttering. Experience at the Children's Psychiatric Service at the Johns Hopkins Hospital has shown that no specific emotional or environmental factor produces stuttering with any significant regularity. This applies to constant and even harsh correction of a child with rapid, repetitive, or slovenly speech, as well as to any other type of environmental disturbance. Sibling rivalry, for instance, either in the form of rejection feelings at the birth of a younger sibling or inferiority feelings at inability to compete with an older sibling, is conspicuously present in some stuttering children. Yet 45 per cent of the cases here discussed were only children, whose emotional disturbances arose from totally different causes. In the study of psychosomatic medicine it has been found that emotional tension frequently results in physiological disturbances. When this emotional tension occurs during the period when the child's speech pattern is being formed, it may well result in a dislocation of the speech pattern to be diagnosed as stuttering. However, why some children react to emotional pressures with stuttering while others react with other neurotic symptoms is not definitely known.

From the point of view of the speech therapist, stuttering children under the age of five may be roughly divided into three classes on the basis

of the intensity and character of their emotional problems. These will be illustrated with brief case histories.

*Type one*: John, a child of three years eight months, appeared to be a fairly healthy, aggressive, independent child for his age, with the exception of stuttering speech and other minor emotional symptoms. The case history disclosed sensible parental care, attention, and affection. Recently, however, the maternal grandmother had come to live with the family. She lavished affection on the child at one moment, then at the next criticized actions of the child which were approved by the parents. She tried to make the child's training more rigorous in certain respects, but on the other hand would secretly gratify certain of the child's wishes which had been denied by the parents. In short, the child's environment had become confused, uncertain, and capricious. After the examination it was obvious to the parents wherein the trouble lay. The grandmother soon left the home and the child's speech returned to normal.

This is an example of a relatively healthy child whose stuttering closely follows the introduction of a disturbing element into his environment. No basic personality maladjustments as yet seem to have taken place. The removal of the disturbing element removes the emotional disturbance, and the speech returns to normal. It should be noted, incidentally, that in 33 per cent of the cases studied, one of the prime factors was the disruptive influence of grandparents, aunts, or other relatives.

*Type two:* Richard, four years 10 months old, was an ungainly, awkward child whose appearance was not pleasing and who was painfully shy, anxious, and fearful. He stuttered severely. The father was a brilliant and successful surgeon who completely ignored his home and the child. He rejected the child because he felt that his awkward and unpleasing appearance was somehow a reflection on himself. The mother, although basically a sound and intelligent person, had become progressively more disturbed since the birth of the child and the development of her husband's hostile attitude toward him. The history showed that the child had been subjected almost from birth to a home filled with tension and severe emotional conflicts.

This case is the other extreme from that of John. In addition to stuttering, the child had a whole constellation of neurotic symptoms and tendencies. The child had been emotionally disturbed and insecure for so long that no quick relief was possible. Furthermore, from the practical point of view, the disturbing conditions in the child's home could not speedily be remedied. The father throughout the treatment refused to come to the speech therapist. The first person to treat, therefore, was the mother. She had to be made emotionally strong enough to carry through the program of care for her son alone. In order to do this, she had to be given independence from the anxieties and tensions from which she herself suffered. Then she had to supply for her son an environment in which he could regain his emotional health. The treatment was long and involved. The mother was intelligent and determined, however, and with the help of outside aids, such as intelligent handling by the boy's teachers in nursery school, the boy was finally helped to develop normal, fluent speech. In order to do this, of course, his other neurotic symptoms and tendencies had to be handled at the same time. Such a case actually represents a severely disturbed child with stuttering as one of several symptoms.

*Type three*: The third type is so familiar to workers in the field that a general description will be more valuable than a case illustration. These children stand somewhere between the first two types. They are not highly neurotic, but they are generally dependent, confused, and fearful; they

are shy and emotionally unsteady; they seem anxious and exhibit a constant inner restlessness. Such children frequently exhibit asocial behavior tendencies. They are occasionally uncomfortable with other children and prefer familiar adults to strangers. They want their wishes gratified immediately and may cry hysterically if they are denied anything. Their moods and emotions, however, change swiftly, and they over-react emotionally to almost all situations. In short, they are what are commonly referred to as 'sensitive children.'

In the author's experience, such children frequently have a long background of overprotection, pampering, and overanxious, obsessively perfectionistic parents. It is significant that the average age of the mothers at the birth of the children in this study was 28 years. Too much is expected of the children in the way of cleanliness, eating, toilet habits, manners, consideration for others, and general decorum. Too little credit is given them for their ability to look out for themselves and to survive physically a normal amount of childhood falls, cuts, and dirt. They are made anxious and fearful by the similar feelings of their parents. They are frustrated and made to feel inferior by the high standards forced upon them. And, most important of all, they are confused by the indecision and inconsistency usually characteristic of overanxious parents. A calm and consistent household, even though it may be unduly strict or even harsh, is far less likely to produce stuttering than a household where the atmosphere is indecisive and capricious. This third type of child constitutes the largest percentage of all cases.

Anyone who is familiar with the fears and anxieties of an adult stutterer and is acquainted with the great effort and diligence necessary to overcome them even with constant professional assistance, will realize that stuttering should be handled at as early an age as possible. Treatment in most cases is far quicker and easier with children than with adults. Moreover stutterers under the age of five, even those with severe speech dislocations, can in most cases be guided toward completely normal speech without any future recollection of stuttering by the child.

A comparison of the incidence of stutterers today with surveys made twenty years ago indicates that workers in speech have accomplished little in the field of preventive therapy. It is the author's belief that the key to this preventive therapy lies in far greater emphasis on the treatment of stuttering in children under the age of five.

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# Clinical Use of Fiction and Biography Featuring Stuttering

Melba Hurd Duncan*

SUGAR-BOY in Robert Penn Warren's Pulitzer Prize novel about the Huey Long regime (**9**) would unquestionably be in the running in a contest for the wettest stutter in fiction. But the description of Sugar-Boy's speech is hardly the place to begin this discussion. Many of our new students in the group are not yet objective enough about their stuttering to accept Sugar-Boy with good humor, although we may wish to introduce him a little later.

Suppose we start with the famous fictional bishop who stuttered. That is, if he really *was* a bishop. One of the central questions around which the story revolves (and *how* it revolves!) as presented by Erle Stanley Gardner in *The Case of the Stuttering Bishop* (**3**) is: Could a person who stuttered become a bishop in the Church of England? 'Bishops,' lawyer Perry Mason reasoned, 'have to work up. . . Now if a person stuttered, he'd hardly become a minister, any more than he would a lawyer. But if he *did* stutter and *was* a minister, he'd hardly become a bishop.

Was Perry Mason right? (This, Clinicians, might be a good place to administer the Test of Attitude toward Stuttering (**1**).) 'The man may be a damn clever impostor,' said Perry Mason. 'On the other hand, he may be a bishop who's been through some experience which has produced an emotional shock. If I remember my medical jurisprudence, one of the causes of stuttering in adults is sudden emotional shock.' (This, Clinicians, might be an opportunity to introduce some of the theories of the nature and cause of stuttering.)

It should be clear now that we are using stuttering as featured in fiction and biography to help objectify stuttering for Joe Doakes, who stutters, and for Kate, the student clinician. The adventures of the bishop can make a contribution as a point of departure for discussion in group therapy sessions. In fact, the Perry Mason mystery in the Pocket Book edition is a useful outside reading assignment. And for microphone practice on voluntary or pseudo-stuttering, Joe Doakes is eager to read the part of Bishop Mallory of Australia when he stares at Perry Mason and says, 'You're a very c-c-c-clever lawyer, Mr. Mason.'

Even on the next to the last page lawyer Mason's secretary, Della Street, is still troubled. 'But there's one thing that still puzzles me,' she says to her chief. 'If the bishop is a real bishop and not a phony, what about that stutter?'

'He told me all about it,' Mason replies. (But of course we won't tell here!)

A real-life minister who *did* stutter, though he wasn't a bishop, was Charles Kingsley (**5**). He said, 'As for stammering, I have seldom known a case worse than my own.' He believed it to be curable, but listed two obstacles to cure. Our students in clinic will enjoy evaluating his theory that all 'stammerers' speak 'with an empty lung' and that the following exercise will help:

> Take a pair of very light dumbbells and exercise your chest with them, taking care to *in*spire deeply when you raise them over your head, and when (consequently) the ribs are raised, and

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lungs expanded. Do this slowly and quietly and I think you will find, though it will not cure you, yet it will relieve and comfort your breathing enough to give you confidence in my hints.

A pupil of Kingsley's said of him:

In conversation he had a painful hesitation in his speech, but in preaching, and in speaking with a set purpose, he was wholly free from it. He used to say that he could speak for God but not for himself.

The enlightened member of our clinic will find a clue to Kingsley's ability to preach without stuttering in ths same student's description of Kingsley's public speaking voice: '. . . the strange, rich, high pitched musical monotone in which he prayed and preached . . .'

Charles Kingsley was reported to be highly sensitive as a child. He had an attack of brain fever and when ill was moved into the celebrated ghost chamber in Barnack Rectory where they lived. We are told that for years afterward his imagination was haunted by the weird sights and sounds associated with that time in his memory: 'He often told his own children in after life he had seen too many ghosts at Barnack to have much respect for them.' Our clinic group will also be interested in discussing his statement that as an adult he looked back and regretted his parents' decision not to send him to Rugby because he believed 'That nothing but a public school education would have overcome his constitutional shyness, a shyness which was increased by the hesitation in his speech ("that fearful curse of stammering" as he calls it, "which has been my misery since my childhood.")' (Question to Kate: Clues supporting how many theories of causation can be found in Kingsley's life?)

A famous man in real life who felt his stuttering would prevent success in the clergy was Somerset Maugham. He says his uncle had always hoped he would go into the church, 'though he should have known that stammering as I did, no profession could have been more unsuitable. . .' Joe Doakes will wish to read for himself the interesting comments Maugham makes about his speech and his personality in *The Summing Up* (**7**), which the publishers describe as the autobiography of Maugham's mind. Analyses particularly pertinent to our group-therapy discussions may be found on pages 47, 66, and 78 of this book.

Maugham was well-fitted by his own experience to speculate on the contribution stuttering made to Arnold Bennett's career as a writer. In his essay on Arnold Bennett (**8**) he makes what is probably an evaluation of his own stuttering by describing the effect of Bennett's speech on his social adjustment:

Everyone knows that Arnold was afflicted with a very bad stammer; it was painful to watch the struggle he had sometimes to get the words out. It was torture to him. Few realized the exhaustion it caused him to speak. What to most men was as easy as breathing—to him was a constant strain. It tore his nerves to pieces. Few knew the humiliations it exposed him to, the ridicule it excited in many, the impatience it aroused, the awkwardness of feeling that it made people find him tiresome, and the minor exasperation of thinking of a good, amusing, or apt remark and not venturing to say it in case the stammer ruined it. Few knew the distressing sense it gave rise to of a bar to complete contact with other men. It may be that except for the stammer which forced him to introspection Arnold would never have become a writer. But I think it is not the least proof of his strong and sane character that notwithstanding this impediment he was able to retain his splendid balance and regard the normal life of man from a normal point of view.

Arnold Bennett's wife accepted her husband's theory of the cause of his stuttering (**2**). She said of him:

Arnold Bennett has a highly strung temperament, which is noticeable in spite of his calm manner. An accident which he had when he was about twelve may have increased his inborn sensibility. While playing with a mangle he caught his hand, which was badly smashed. The nervous shock was intense. It affected the delivery of his words, and caused him to stammer,

> which he had never before been noticed to do. He was never absolutely cured of this. Though fear of being unable to deliver his words at a psychological moment has somewhat handicapped him in his private and public life, it has no doubt given him other advantages no less valuable to the career of a man of letters—it gives him time to reflect before speaking, for example.

(This, Kate, would be a good place to stop and have Joe Doakes lead a group discussion on: In What Ways Stuttering Has Been an Advantage to Me.)

Bennett's wife gives a slightly caustic description of her husband's ailments, which was written when Arnold Bennett was 57:

> He believes in taking medicine. One of his pet habits is to try new medicines recommended by his friends when he happens to complain to them of sleepless nights, bad digestion, rheumatism, etc. . . . Not only does my husband like to take medicine, but he loves people to be interested in his health. When a friend remarks, 'How well you look!' he will answer, 'I feel A-1 thanks to Enos Fruit Salt,' if at that time he happens to be swearing by Enos' Fruit Salt. . . . Doctors proclaim that he is a strong and healthy man.

The cases drawn from our collection of speech defects featured in fiction and biography for presentation here are all of stutterers. But there is probably not one stutterer among them who could look at himself as dispassionately as Andrew Tallon with his cleft palate in the novel, *The Tallons* (**6**). Andrew would have been considered a handsome man 'except for his mouth with its triangular cleft which sprang angrily from lip to nose.' Andrew told the gaping children he bet they couldn't talk the way he did. 'I could,' said George, 'only it ain't manners.' 'Go on and try,' Andrew urged him, 'I don't believe you.' When George tried, 'Ho hon unt hie. Hi hont uhleeve hoo,' Andrew bent forward and slapped his thigh. 'You're away off,' said Andrew, 'You're nowhere near right.'

AMONG our fictional stutterers, however, we *do* have unemotional Flexinna. She appears in quite the most diverting book in our collection (**10**). Flexinna was untroubled by her stuttering except that it prevented her from becoming a vestal virgin in old Rome. If the author's portrayal of Flexinna's objectivity stems from any historical basis in the attitude toward speech defects in the period of which he writes, some of those upper-crust Romans must have been remarkably sensible.

Flexinna stutters in *The Unwilling Vestal* (**10**), a period romance sometimes on the recommended reading list in high school. It is the story of Brinnaria who was chosen, against her will, to serve as one of the six vestals who kept the fire burning perpetually in the Temple of Vesta. A vestal had to serve 30 years after her inauguration. At the end of that time she might be 'exaugurated' if she wished, and then could marry if she chose to do so.

Because of the flight of many families from Rome during the pestilence, Brinnaria, a remarkably precocious child physically and mentally, was the only girl in the city who fulfilled the requirements of a vestal when a vacancy occurred as the result of the Chief Vestal's death. That is, she was under 10 years of age, with both parents living and noble, without any blemish or defect of body, any impediment of speech, any difficulty of hearing. Brinnaria's best friend was Flexinna, who stuttered. Chapter Three is entitled, 'Stutterings,' and is the account of a conversation between Flexinna and Brinnaria about the vestal's state of servitude. The author has Flexinna stutter on consonants only, and represents her speech by repeating the initial consonant two times: 's-s-sensible.' Flexinna thought it would be marvelous to have all the privileges of a vestal. 'I wish I were you,' she raged to the indifferent Brinnaria, 'If I were only under ten and d-d-didn't s-s-stutter, I'd d-d-do all I c-c-could to g-g-get D-D-Daddy to offer m-m-me.'

Years later, after Flexinna had been married for a long time and Brinnaria

had become accustomed to the privileges and restrictions of being a vestal, Brinnaria wanted to spend a night away from the temple to try to save the life of the man she had loved since they were both children of 10. She disguised herself in Flexinna's clothes and departed in a dense fog, with Flexinna's husband riding by her carriage. 'For Castor's sake,' was Flexinna's parting advice, 'd-d-don't forget to stutter!' Brinnaria didn't. We are told: 'At the bitterest moment of her life, what kept back her tears was her tendency to laugh at the fact that in the midst of her agony she did not forget to stutter.'

Flexinna eventually had 'children of all ages in abundance.' Flexinna said of her children quite matter-of-factly, 'Not a stutterer among 'em.' (To put Kate's mind at rest about the outcome, the man Brinnaria loved was faithful to her for 30 years and she married him when she was exaugurated.)

Flexinna centainly wasn't sensitive about her speech problem, and Brinnaria treated it lightly on occasion. Once when Brinnaria, with her vestal's privilege of dining with friends, was talking with Flexinna in the latter's home, she made her point in serious discussion with the remark, 'What's the use of supposing? Suppose the moon fell on your front teeth, would you stop stuttering?' (Joe Doakes thinks she might at that).

And now perhaps Joe is objective enough to introduce Sugar-Boy to our clinic group. His name was O'Sheean but he was called Sugar-Boy because of his weakness for sugar lumps. He was very tough. (Kate will want to consider his secondary symptoms.) We meet Sugar-Boy, the Boss' chauffeur, on page five. We first hear him speak at the top of page six after he has skillfully maneuvered the speeding Cadillac between the mule's nose and the gasoline truck:

> And Sugar-Boy's head would twitch the way it always did when the words were piling up inside him and couldn't get out, and then he'd start. "The b-b-b b-b," he would manage to get out and the saliva would spray from his lips like Flit from a Flit gun. "The b-b-b-b-bas-tud—he seen me c-c-com-ing." Sugar-Boy couldn't talk but he could express himself when he got his foot on the accelerator.

He also expressed himself with a .38 special which Jack Burden, the narrator in the story, says 'rode under his left armpit like a tumor.'

Perhaps Kate should close this group session with a warning not to emulate Sugar-Boy's compensations for his speech deficiencies. Joe Doakes might lead a discussion on the compensations the members of our group have made. To our clinicians we add a request that they bring in items to add to our collection. At the next session we'd like to have volunteers read a short story (4) which we haven't time to tell you about today concerning a stutterer who made an unwholesome compensation.

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# Prostigmin and the Chronic Stutterer

Howard J. Schaubel*
Roy F. Street

THE successful use of prostigmin by many investigators in the treatment of spastic conditions of muscles influenced the authors to try the drug on patients with a stutter. To all outward appearances, the stutter is a muscle spasm. The cause is probably not to be found in the muscle groups or the nerves regulating them, but if the control of the spasm can be made easier, the correction of the stutter will be simplified.

Kabat and Knapp (**3**) reported the use of prostigmin in the treatment of acute poliomyelitis. They concluded that the drug decreased muscle spasm and improved coordination in patients with anterior poliomyelitis. They demonstrated that the depressant action of prostigmin was on the spinal cord.

Schweitzer, Stedman, and Wright, (**7**) showed that eserine stimulates the reflexes, whereas prostigmin in equivalent amounts depresses them. The authors suggest that this might be due to the fact that prostigmin is lipoid-soluble and thus might be able to penetrate into the nerve cell and cause a rise in intracellular acetylcholine concentration which could depress the activity of the cell. Eserine is water-soluble and thus remains outside the cell and therefore could increase the acetylcholine concentration at the synapse to produce excitation.

Kremer (**4**) has shown that prostigmin depresses the muscle tone and reflexes in man. He maintains the effect is localized on the spinal centers.

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Schaubel (**6**) demonstrated some improvement in patients with cerebral palsy when prostigmin was administered and mentioned that speech improvement was observed when an initial speech impediment was present.

Ainsworth (**1**), Hahn (**2**), Reid (**5**) and many others have summarized the theories about stuttering. There is much disagreement as to cause. Treatment must therefore depend largely upon clinical expediency.

It has been assumed in this study that if the tempo of living can be modified and if factors which create tensions can be reduced, the chances that the stutter will diminish in intensity, or disappear, are good. It is further assumed that if the use of prostigmin can make it easier for the patient to manage the stutter, the general body tension can be reduced. It is impossible under normal living conditions to control the way these patients live. Data must therefore be collected on the basis of careful observation and reported as faithfully and honestly as possible.

## Procedure

This experiment was begun in February, 1947 when 10 stutterers ranging in age from 14 to 40, nine males and one female, were started on the use of prostigmin. Each received four 15 mg. tablets a day. All had previously had some form of speech therapy, but none was receiving any help at the time the study was started. The severity ranged from mild blocks, appearing under tension, to a very severe stutter, accompanied by facial contortion. Intelligence was measured

by the Terman-Binet test in eight cases and the Wechsler-Bellevue scale in three cases. All but one had I.Q.'s above 100. The general attitude towards the medication ranged from hopefulness to negative skepticism.

Treatment extended from February, 1947 until May, 1948, with most patients discontinuing dosage during the summer months because of the inconvenience involved. The families of the patients were contacted at six intervals during this period, when some member of the family, usually the father or mother, was asked to tell as accurately as possible his observations of the speech of the patient. The patients themselves came to the office at two-month intervals. They were asked to tell about their general activities and way of living. The speech was discussed as casually as possible, every effort being made to avoid leading questions. Three types of information were sought: What factors were creating tensions? What about the tempo of living? What about the speech itself? Five followed a fairly uniform pattern and can be reported as a group. Some of the reactions and accompanying circumstances were so unique that individual analysis was necessary.

The youngest boy, a high school student, was not taking the prostigmin regularly when the first check was made, and there not being any assurance that he would do better, he was dropped and another high school boy substituted.

## Results

After four months it was possible to make the following observations: The parents of six of the patients reported that during this period there had been no noticeable reduction in the incidence of the stutter, but that it had become much easier to manage and speech seemed easier. All felt there was less tension created by the stutter itself. One parent felt there were times when the stutter was managed more easily, but could see no sustained change. The parents of another boy felt there had been evidence of ease in managing the stutter the first six weeks, but that following a severe case of influenza, the stutter had become worse in every respect. Two members of one family where tensions were very high, a father and son, agreed that there was no noticeable change, except possibly for the worse. Aside from the one case of severe illness, there were no significant changes in circumstances creating tensions or in the general tempo of living.

The examiner made the following notes at this time: Four of the patients managed the block so well in the office that it was hard to detect. The girl whose stutter had been very severe at the first conference was now talking so well that only an infrequent block occurred and that was managed so well that there was no break in the sequence of talk. It seemed to the examiner that the boy who had had influenza was managing his stutter much better than at the first conference. This boy had become much more at ease in coming to the office, which also had to be considered. Two of the patients evidenced the same difficulties as at the first conference. Both had been frequent visitors at the office before the experiment started. One noticeable factor at this time was that four of the boys were gaining weight. Unfortunately, the factor had not been considered at the beginning of the experiment and accurate measures of gain were not available.

The boys were scattered on out-of-town projects during the summer months and medication and conferences were discontinued. During this period the girl became seriously ill and the prostigmin had to be discontinued. The father and son, who felt there had been no gain from the medication, refused to continue beyond this point. Starting in September, medication and observations were re-

newed with seven patients. Six followed through to the end; one discontinued in December.

Concluding the experiment in May, the following observations could be made: The tensions which were so great for the father and son, who dropped medication after the first four months, were greatly reduced by the end of the experiment. The boy's stutter was much less severe and more easily managed. We have no way of knowing whether the few weeks of medication were a factor or not. The father's stutter pattern remained much the same. The girl who became ill shortened the amount of time spent at school, which greatly reduced her tensions and also her tempo of living. In May, she was almost entirely free from the stutter.

The boy who had had influenza started college in the fall. His stutter became so bad he quit school and went to work. The stutter became increasingly worse and he supplemented the oral dosage with injections. The stutter continued to be severe. He was apprehended for forgery, convicted, and sent to the penitentiary in the spring. He had obviously been under severe tension for months. Following arrest and conviction, the stutter decreased in incidence and intensity.

During the last few months of the experiment, it became increasingly difficult to keep the boys on medication, as they all felt they were no longer securing any benefit. The boy who stopped medication at Christmas seemed completely free from the stutter, in spite of increased tensions and a higher tempo of living. The examiner could detect no stutter during the final conference. The five remaining cases can be reported as a group. Tensions in all cases had been reduced. School problems were at a minimum and attitude towards the stutter had either become one of tolerance or indifference. One boy had attended a summer camp for stutterers and had returned with less tension and a much better attitude towards the problem. All of the boys had put on weight. All were enjoying what they were doing. Tensions in the home were at a minimum. The tempo of living was slowed in all cases. Two whose stutter had originally been mild now considered themselves as not having a stutter and none could be detected in the office. Three who had been severe stutterers now had very mild blocks when under stress, which they managed very well until the stress became great.

## Conclusions

In a study such as this there is no way of knowing just how much the medication was responsible for results. We can report the observed facts; we can also hazard a few conclusions. There seemed to be good reason to believe that the prostigmin did have some effect on the severity of the spasm during the early weeks of its use and possibly later, making it easier for the patients to manage the stutter. It can be assumed, therefore, that the tension created by the severe spasms was reduced. The gain in weight must also be considered as a possible result of the use of the prostigmin, or might be the result of decreased tension. It is also obvious that where the tensions increase or become very great, they outweigh any beneficial effects which might be secured from the medication. In this study any effort to carry out speech therapy was purposely avoided as much as possible during the period of the experiment. The observed improvements in ways of living either resulted from normal changes or were a part of a general relaxed feeling which might have followed the drug therapy.

The evidence seems to warrant the assumption that the use of prostigmin as a part of general therapy with the chronic stutterer might have value. Other investigators, with greater facilities, more resources and much ingenuity will find it worthwhile to

attempt a controlled experiment, especially with younger patients.

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# Neurological Factors in the Etiology of Delayed Speech

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THE literature on the various aspects of delayed speech is extensive, but in spite of the number of investigations that are available, many problems remain unsolved. Perhaps the greatest controversy in the entire field has concerned nomenclature from a neurological standpoint. Even today, there is no unanimity of opinion as to the applicability of the terms 'congenital aphasia' and 'audimutitas' to these developmental defects of language. It is significant that detailed neurological observations, including encephalography, and the more recently developed psychological investigations exploring the perceptual and conceptual fields, pathological behavioral deviations, psychometric technics, etc. have received limited utilization in this area. The majority of previous researches have been confined largely to a specialized field, such as neurology, pediatrics, speech pathology, medicine, psychology, etc. The purpose of this study, therefore, has been to investigate this general problem from an organismic standpoint, with a particular attempt to correlate the neurological findings with a more satisfactory classification and organic diagnosis.

## Factors Influencing Language Development

In order to understand completely the many problems associated with delayed speech on a developmental basis, it is necessary to be familiar with the various phases of normal linguistic acquisition. This problem will not be discussed in detail at this time as it has been the subject of much previous independent research. One point, however, deserves special emphasis.

Stinchfield and Young (**78**) speak of a period of speech readiness, or a time during which a child may most readily acquire language. This most commonly occurs between the ages of 12 to 18 months, although it is noted that gifted children as well as those who develop precociously, may begin to talk as early as nine months. They further point out that although language may well develop after two years of age, it will be acquired with less facility than during the normal period. It is probable that 'speech readiness' is synonymous with normal maturational factors. The figures quoted for this period vary with different authors. Karlin and Kennedy (**46**) give a maximum time of 24 to 30 months for language development, after which the disorder should be investigated. Other approximate times have been given as follows:

1. Berry and Eisenson (**6**), 30 months
2. West, Kennedy, and Carr (**87**), 42 months
3. Van Riper (**81**), 30 months
4. Blanton (**7**), 36 months
5. McCready (**57**), 18 months

McCready further stated that the gravity of the situation increased every month after 15 months. He also felt that intelligence was largely dependent upon language in some form, as intelligence could not exist without language.

It is important also to realize that different factors occurring during the

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developmental period may influence the acquisition of speech, such as:

1. Delayed motor development
2. Impaired intellectual level
3. Interference with adequate emotional development
4. Perceptual delay: vision, hearing, etc.
5. Inadequate socio-economic status
6. Limited environmental experience
7. Age of associates
8. Multiple births
9. Situational status
10. Bilingualism
11. Sexual differences
12. Debilitating disease, prolonged illness, endocrinological problems
13. Maturational factors. Influence of myelogeny and alternate theories in relations to acquisition of function.

## Historical Survey

*Evolutionary Aspects:* It is necessary to allude to the progressive evolutionary encephalization of the brain in order to understand the neurological concepts of these disorders. Unfortunately, there is little anthropological evidence available in the form of prehistoric human brains, although Smith (**73**) has had the opportunity of studying a few dessicated cerebral remains from ancient Egypt. His data, however, have little bearing on the present investigation. The essential, pertinent material has been derived from a review of the skull fragments and endocranial casts of the various anthropoids, historic man, and homo sapiens. This research has demonstrated that the principal evolutionary expansion has been in the frontal lobes.

Examination of various endocranial casts reveals that the human brain was larger than the primate gorilla, which is the closest anthropoid to man, and that the left frontal lobe was slightly greater in size that the right, pointing to possible early dominance. The particular prominence of the left inferior frontal convolution suggests the development of language although viewpoints are divided in this respect (**44, 80**). In addition, the remaining three major lobes of the neopallium showed increased organization indicating augmented functional capacity. This level of development of Pleistocene human culture has been characterized by the following advancements from the anthropoid stage, according to the research of Tilney (**80**):

1. The development of cerebral dominance and handedness.
2. The beginning of prehension.
3. The acquisition of speech.
4. Assumption of erect posture.
5. Early appearance of personality and cognitive abilities.
6. Increased range in auditory and visual functions.
7. Improvement in motor and kinesthetic endowment.

Progressive encephalization has continued through the centuries with increased range in function. This is shown by increase in size of what is now known as Broca's area, indicating greater linguistic capacity and higher psychic abilities, as derived from a study of the endocranial casts of Piltdown man. The progressive development of the telencephalon in the successive Rhodesian and Neanderthal cultures suggests that speech had almost reached the attainment achieved in homo sapiens. Through this gradual process of development it can be seen that the various lobes subserve special functions which are more or less independent, although closely connected by numerous association pathways. This is not meant to imply that any one portion governs the remainder, although the frontal lobes more nearly approach the role of director of function and behavior with general integration of activity. This view has also been recently expressed by Halstead (**36**).

Although articulate speech and symbolic behavior have been designated as primary factors in the superiority of man over his simian ancestors it cannot be denied that methods of communication in the form of gestures, sounds, intonation, and intelligent behavior exist in lower forms (**66**). In fact some investigators feel that there may well be a distinctive language in apes and monkeys. Higher

apes such as the gorilla and chimpanzee are said to have a much superior type of speech than monkeys, and there also appears to be some racial specificity (**55**).

*The Problem of Cerebral Localization*: To further illustrate the importance of neurology as a basis of study for these disorders, it is necessary to consider this problem of localization in greater detail. It is coincidental that the earliest theories of cerebral localization were those promulgated by Gall and Spurzheim (**27**) in relation to speech, and it is indeed unfortunate that these early theories which located this function in the frontal lobes were not more carefully studied, as research problems of this type might well have been on a more advanced plane today. As is well known even in modern times, their names were linked with the so-called science of phrenology, but their contemporaries and those to follow completely overlooked the real value of their observations.

Flourens (**22**), as a result of numerous cortical ablation experiments, concluded that the brain functioned as a whole, initiating the holistic approach to investigations of this type. He condemned regional or atomistic localization or compartmentalization of brain function as advocated by Gall and Spurzheim, and it was largely through his efforts that phrenology fell into disrepute. Goltz (**32**) and Loeb (**52**) working with dogs, Franz (**24**) with cats, and Lashley (**50**) with rats, concluded that intelligence per se was a general rather than a local capacity. These theories may well be true if limited to this field, but are confusing in that some authors regard speech from a psychological and behavioral standpoint and believe that it results from functioning of the organism as a whole rather than unit parts.

The aggregation theory of intelligence has been carefully studied by Munk (**61**), Kleist (**48**), von Monakow (**82**), and others. This school maintains that there is a discrete situation of functions such as visual, auditory, speech, kinesthetic, etc., all of which are linked with numerous association pathways. The aggregate performance of these various fields results in intelligence.

Regional localization has been demonstrated by numerous observers following Gall and Spurzheim, including Bouillaud (**10**), Dax (**17**), and others. The story of Broca's celebrated work culminating in his report of 1861 (**12**) is familiar to all those interested in the problems of dysphasia. There then followed the so-called school of diagram makers who attempted to locate speech functions in certain restricted cortical areas all of which could be charted easily. These workers included: Bastian (**3**), Broadbent (**11**), Wernicke (**86**), Kussmaul (**49**), Dejerine (**18**), and others.

Electrical stimulation of the lower portion of the dominant precentral convolution results in movement of the muscles of the peripheral speech apparatus but without external verbalization, as shown by Kapper's research (**45**). Word formation is possible only after stimulaton of the left inferior frontal convolution. Injuries, tumors, inflammatory changes, etc. to this region show loss of productive speech with retention of motor control. This area is larger than originally described and includes sections 47 and 48 in addition to the previous area 45 of Brodmann (**45**). Mellus (**58**) further states that this center is more developed in the dominant hemisphere.

The psychological approach to language behavior based on organismic or holistic concepts is the theory most commonly accepted today and was early initiated by the studies of Jackson (**43**), Head (**37**), Goldstein (**29, 30, 31**), Weisenburg and McBride (**85**) et al. Wilson (**89**) prefers to consider the problem from a general point of view including

psychological, anatomical, and physiological correlaries. Considerable evidence against a strict anatomical viewpoint has now accumulated in spite of the more recent observations of Henschen (**39**) and Nielsen (**64**). In fact it is difficult to reconcile the findings as tabulated by these different groups of observers. For example, Henschen studied 1,337 cases of dysphasia. One hundred and two cases of motor dysphasia were examined, 49 of which showed a positive correlation with a lesion in Broca's area and associated speech defect. Eighty-five presented a similar analogy in addition to a secondary lesion elsewhere. Seventeen negative reports were cited, but only six were said to be absolutely contradictory. The ratio of six to 85 was felt to correspond to the usual incidence of left handedness in the ordinary population. The 29 cases with bilateral third frontal convolutional lesions revealed typical dysphasia. Two hundred fifty foci involving the angler gyrus resulted in alexia.

Evidence to the contrary has been recorded as follows. Head (**37**), Weisenburg and McBride (**85**), and others are less willing to make such concise anatomical statements.

Moutier (**60**) working in Marie's clinic made a study of 408 cases of dysphasia with autopsy. His figures included a previous investigation of 104 patients made by Frankel and Onuf (**23**). In the latter series, only four added confirmatory data to Broca's theories of localization. Five additional instances with destruction of the third left inferior frontal convolution showed no clinical speech defect. Of Moutier's 304 cases, adequate data were so meager in 201 that these statistics had to be deleted from the total figures. One hundred seventy-five of these had such extensive lesions that primary localization was impossible. Nineteen of the remainder showed a positive correlation with Broca's concepts; eight with the pathology limited to the cortex with 11 sub-cortical. Fifty-seven cases of dysphasia presented an intact left inferior frontal convolution, and in 27 with destruction of this area, no clinical symptoms were evident.

Further evidence on this subject has been given by Osnato (**66**) from a neuro-anatomical standpoint. Numerous association pathways exist throughout the cortex which show considerable variation in different patients. Few show any degree of constancy such as seen in the cingulum, fasciculi longitudinales, fornix, arcuate fibers, and corpus callosum. Osnato further reasons that if there were any degree of constancy of development of the association tracts in relation to speech and intelligence, dissection should reveal large groups of connecting fibers passing to and from these specialized centers. The fact that this is not true argues against compartmentalization of cerebral function. He further tends to agree with Moutier (**60**) and others that it is dangerous to use the symptoms of aphasia as localizing data. He admits that learning will be so stereotyped in a small percentage of patients that interruption of definite pathways will result in similar defects of behavior. However, on the whole this process is so varied and irregular in the vast majority of individuals that a concept of organized centers in the old diagrammatic sense is actually unscientific.

*Terminology*: Many attempts have been made to organize a satisfactory classification of cases of delayed speech by numbers of the various allied medical, speech, and psychological fields. This has resulted in a considerable array of terms, many of which are synonymous and necessarily confusing if the casual observer is not aware of the various researches.

The designation 'alalia' has been used by the American Speech and Hearing Association in its official dictionary (**68**) to connote absence

of articulation due to malformation or neurological lesion of the organs of the peripheral articulatory apparatus. Qualifying terms were included, such as:

1. Alalia cophica—deaf mutism
2. Alalia glossoteretica—absence of tongue
3. Alalia physiologica — physiologic mutism
4. Alalia traumatica—injury to the articulatory organs
5. Alalia prolongata—delayed speech
6. Alalia uranoschismatica — cleft palate

As is well known, Lordat (cited **64**) originally used 'alalia' to imply disorders of expression in speech, which was later supplanted by 'aphemia' as suggested by Broca (**12**). Trousseau (cited **64**) then advised a change to the term 'aphasia,' which is commonly used today to describe symbolic defects of behavior after the acquisition of language. As the majority of cases show an impairment, rather than a complete loss of speech, it would be better to use 'dysphasia' in the description of these disorders.

The following synonyms for delayed speech have been listed by Stinchfield (**76**):

1. Alalia
2. Aphemia
3. Dumbness
4. Lingual arrests of development
5. Mutism
6. Deaf mutism
7. Hearing mutism
8. Hysterical mutism
9. Lalophobia
10. Phonophobia

Some of these terms used obviously refer to the different etiological factors responsible for the production of this disorder. A later monograph by Stinchfield (**77**) noted the following classification:

1. Alalia—mutism
   a. Alalia cophotica
   b. Alalia organica
   c. Alalia physiologica
   d. Alalia prolongata
      1. Auditory dumbness
      2. Hearing mutism
      3. Mutism prolongata

In addition to the above, the following terms have been employed to designate problems of this type:

A. Congenital or infantile aphasia
B. Congential auditory imperception (Worster-Drought and Allen (**92, 93**).)
C. Audimutitas (**46, 72**)
   1. Motor form
      Alalia idiopathica (**72**)
      Angeborene afasie
      Stummheit ohne taubheit
      Sprachtauheit
   2. Sensory form (**72**)
      Surdomutitas corticalis
      Word deafness
D. Speech inhibited child (**13**)
E. Idiopathic language retardation (**62**)
F. Surditas-verbalis, word deafness (**83**)
G. Conscious auditory perception (**84**)

Wise (**90**) has suggested a revision in the present classification of language disorders along the following lines:

1. Dyskathexia—impairment of speech due to a lesion of the central nervous system, exclusive of the afferent and efferent neurones.
2. Dyspneumia—defect of speech due to a respiratory disorder on the basis of a lower motor neurone lesion.
3. Dysphonia—disorder of voice due to pathology involving the lower motor neurone.
4. Dyseuphonia—defect of resonation as a result of disease of the lower motor neurone.
5. Dysplasia—impairment of articulation due to implication of the lower motor neurone.
6. Dysgnosia—disorder of speech due to interference with the perceptive mechanism.

As can be noted, dysphonia and dysgnosia have been used in the past to describe speech defects of this type. The other terms represent a new approach in classification. It is doubtful if dysphasia and dysarthria will ever be supplanted by dyskathexia and dysplasia, respectively, as the former are not only descriptive and adequate, but are already firmly entrenched in our medical nomenclature. The use of dyspneumia and dyseuphonia would appear quite justifiable. Certainly, respiratory disorders impairing speech are quite common and localized de-

fects of resonation are observed occasionally.

Other authors discuss terminology on the basis of the following components:

1. Designations depending upon etiological factors.
2. Those derived from a study of the dysphasias.
3. Miscellaneous factors.

Numerous writers list impairment of associated language processes also as being instrumental in influencing the development of speech. Blanton (**7**) described several cases with defects of vision in which speech did not develop in the usual time. A similar opinion was expressed by McCready (**54**, **55**, **56**) in cases of word-blindness. Chesher (cited **7**) recognized five developmental language disabilities:

a. Strephosymbolia
b. Word-deafness or regional deafness
c. Motor speech delay
d. Agraphia
e. Apraxia

*Etiological Factors*: Borel-Maisonny (**9**) described cases of speech delay in the paralytic as cerebral palsy, congenital aphasia, psychological difficulties, etc. McCready (**54**) subscribed to the theory of biological variation as to the basis of defects of this type. He further classified speech disorders in children as follows:

1. Delayed speech
2. Speech wholly or partially intelligible
3. Disorders of articulation
4. Stuttering

Glassburg (**28**) divided the causes of delayed speech into two groups: central and peripheral. The former included: aphasia, encephalitis, cerebral hemorrhage, infections, exanthemata, and amentia. Peripheral factors were: deafness, paralysis of the tongue, etc. Treatment was described as being medical, surgical, and educational. Robbins (**69**) has adopted a similar etiological classification.

Guttman (**34**) discussed 30 cases of acquired dysphasia due to tumors, trauma, and infection at a time prior to the acquisition of normal speech, which he regarded as the true type in contrast to the second variety seen in patients with retarded development. McCall (**53**) in a paper entitled 'Two Cases of Congenital Aphasia in Children' included one patient with word-deafness and the other with word-blindness. Sutter (**79**) in an interesting study described the behavior problems associated with children showing delayed speech.

The common etiological factors, including mental retardation, hearing defects or short auditory memory span, prolonged illness, poor coordination, lack of motivation, bi-lingualism, aphasia, poor speech standards, shift of handedness, emotional trauma, etc., have been described by Van Riper (**81**), Stinchfield and Young (**78**), Karlin and Kennedy (**46**), Berry and Eisenson (**6**), and others. Hudson-Makuen (**42**) stressed the possibility of defects in the peripheral articulatory apparatus to explain delay in the acquisition of speech, such as anomalies, cranial nerve paralyses, nasal obstruction, etc.

Allen (**1**) discussed the various etiological factors of delayed speech with case reports. He pointed out a group characterized by defective motor control of the peripheral articulatory apparatus including:

1. Motor lesions
2. Increased muscle tone
3. Cerebellar dysfunction
4. Defective control over the lower reflex arcs
5. Hypotonicity due to various causes

He also called attention to the fact that adequate investigation of these cases depended upon testing of functions other than speech, such as hearing, intelligence, disorders of motor function, psychological, presence of associated physical and mental disease, etc.

The term 'audimutitas' has been used frequently in the literature (Simonson (**72**), Froeschels and Jel-

linek (**26**), Karlin and Kennedy (**46**), and others). It implies impairment of speech in the presence of normal intelligence and hearing, but in the absence of a neurological lesion. It is said, further, to be congenital or acquired, and differs from infantile aphasia as the latter implies a speech defect after the acquisition of language. Simonson (**72**) quotes Schmalz as being the first to describe this condition, although the original reference was not given. Coen (**15**) first suggested that it should be referred to as 'audimutitas.' Nadoleczny (**63**) and Liebmann (**51**) have divided this disorder into four groups:

1. Motor
2. Sensory
3. Motor-sensory
4. Border-line cases

These designations are almost directly comparable to similar defects in the dysphasic, hence a detailed description will not be given of each category. Associated disturbances in hearing, vision, and motor function were often present, and the need for early special instruction was emphasized by Simonson (**72**) who also preferred the above classification.

Audimute children were said not infrequently to have emotional and environmental influences. Allen (**1**) stressed the potential normal intelligence but emphasized the possibility of mental retardation if untreated. It is interesting that a school for children of this type has been developed through interest in the pioneer researches of Worster-Drought and Allen (**74**).

Froeschels and Jellinek (**26**) in using 'audimutism' to describe these phases of delayed speech discuss a central type which is subdivided into a motor and sensory form. These are, again, analagous, but not identical with the dysphasias, as in the latter speech has been acquired. They speak also of the presence of disinhibition which helps to differentiate these patients from other forms of audimutism. It would appear that the presence of this symptom would be predicated by the amount and location of the brain damage, rather than to make a generalization that hyperactivity is a characteristic of all audimute (central) children. Other forms of this condition consist of a peripheral type such as seen in anomalies of the peripheral speech apparatus, and a psychic variety. The latter is manifested by a short auditory memory span, impairment of attention, limited concentration, etc.

Seeman (**71**) first postulated the possible association of cerebellar pathology with delayed speech, particularly with changes in the lingula. The latter was found also of primary importance for adequate vocal cord function by Bender (**5**). Peripheral alterations in the auditory fibers as well were not uncommonly related to speech problems. Precechtel (**67**) felt that such changes could be explained in some instances on the basis of pathological fetal positions which occurred in approximately three per cent of the cases. Six examples of this type were described, two of which showed histological changes in the central nervous system consisting of hypoplasias, clefts, and hypotonic disturbances implicating the medulla, mid-brain, and cerebellum. The latter was always involved with the maximum pathology being in the lingula. Three additional cases showed hypotonic degeneration of the neuroepithelium of the cochlea and vestibule, together with delay of development of the middle and inner ear. Holmes (**41**) in a study of acquired cases of cerebellar injury found the vermis more likely to be associated with errors in phonation and articulation. Stenvers (**75**) stated that many cerebellar areas have been suggested as being important for speech function, particularly the lingula, lobulus simplex, nodulus, and uvula, but he did not believe that this association had been proved. He felt that this function

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was more likely to be regulated by the neo-cerebellum in relation to the evolutionary recency of the speech mechanism.

Gall and Spurzheim (**27**) were apparently among the first to recognize the importance of delayed development of speech in children. The term congenital aphasia came into use in the latter part of the nineteenth century, reflecting the then current views on localization. This designation was used also to include the various disorders of associated language function such as vision, hearing, etc. which were described as congenital word-blindness, word-deafness, etc.

Hadden (**35**) described three boys who suffered from a defect of speech on the basis of defective auditory patterns which he termed 'idioglossia.' Intelligence was not defective and speech was characterized by lalling. A similar case was reported by Taylor (cited **4**). Guthrie (**33**) summarized the literature and added several new patients, expressing the opinion that their defect was due to a congenital deficiency. McCready (**54**) attacked this problem from an ontogenetic viewpoint due to the familial factors and lack of birth trauma, and referred to them as partial word-deafness.

Kerr (**47**) in discussing four cases of sensory aphasia included one patient with pure word-deafness, one with crossed amblyopia, and two with congenital word-blindness with alexia. Other early investigations along these lines were conducted by McCall (**53**), Morgan (**59**), and others. Rogerson (**70**) did not feel that word-deafness was an aphasic disorder, as the recognition of crude sounds as well as speech was impaired, and therefore the defect should be on a lower level. He reasoned accordingly that the term 'congenital auditory imperception' suggested by Worster-Drought and Allen (**92, 93**) was a more applicable designation. Weber (**83, 84**), on the other hand, prefers the use of 'surditas verbalis' in contrast to that of 'caecitas verbalis' for word-blindness.

Other early synonyms that have been used with congenital word-blindness include:

1. Congenital symbol-amblyopia (**14**)
2. Congenital typhlolexia (cited **55**)
3. Amnesia visualis verbalis (**91**)
4. Strephosymbolia (**65**)

Dozier (**20**) discussed the various characteristics of nerve deafness under the following categories:

1. Hearing normal
2. Defective comprehension of spoken language
3. Auditory inattention
4. Retention of sound recognition other than language, such as mechanical, musical, animal, etc.

In congenital word-deafness, speech is characteristically delayed and shows neologisms and disturbances of articulation. No localized or progressive neurological defect is said to be present. Abnormal activity has been noted, and psychometrics reveal the disturbance in language function. Emotional factors may accentuate the behavior found, but these are not primary. Dozier (**20**) feels that word-deafness should be regarded as a constitutional impairment and research is needed with the cooperation of the otologist, psychologist, and neurologist. The development of handedness may be delayed and occasionally it is said to be familial. No encephalograms were performed in these cases. Henderson (**38**) in discussing the various causes of delayed speech stated that aphasia in children is rare and that when present, it is more apt to be of the congenital auditory imperception type. Orton (**65**) and Ewing (**21**) have also called attention to this selective loss of recognition of the spoken word without loss of pure tones in the range of speech frequency.

Cases of congenital word-deafness are rare. In addition to the main characteristics already recorded, there appears to be an inability to comprehend spoken words and less specialized sounds. The attempt to produce the

various sounds and words heard results in a characteristic language peculiar to the person and has been termed 'idioglossia.' That it is not an incomprehensible jargon has been shown by extensive study which allows the observer to understand the meaning, and it has been found that the family and others associated with the child understand him well. Worster-Drought and Allen (**92, 93**) have suggested that this condition be called 'congenital auditory imperception' rather than word-deafness. The latter designation refers to the adult process and is rather limited in definition. Further, the term 'congenital auditory agnosia,' which has been also used for these cases, is too broad in its scope as it implies loss of recognition of all sounds.

Worster-Drought and Allen (**92, 93**) and Allen (**1**) feel that congenital auditory imperception is due to either of the following mechanisms: birth trauma with hemorrhage into the temporal lobe, normality of which is essential for the speech mechanism; and presence of a biological variation or aplasia in the receptive areas located within the temporal lobes. In the latter respect, there has been a definite tendency towards familial transmission. Unfortunately, no encephalographic or autopsy confirmatory evidence is yet available. Although these authors have felt that this condition is on a lower level than the dysphasias, the evidence would appear to the contrary, even by a study of their case history which was reported in great detail. They examined a 12 year old boy with Head's dysphasia tests and found some dyslexia, agraphia, and impairment of expression and comprehension of speech. In fact, they stated that their patient satisfied Head's qualifications for the verbal aphasic group. Similar cases have been described by Creak (**16**), Wilbur (**88**), and others. Here the similarity ends, however, following the lines of our previous discussion in the differentiation of delayed speech in childhood and acquired forms of aphasia.

Another group within this general category has been described by Ewing (**21**) as the high frequency deaf child. In 10 previously diagnosed aphasic children, he found that six had a progressive loss of hearing above 250 cycles. These patients apparently presented none of the typical signs observed in a primary speech disorder, although it was first felt that all cases of congenital aphasia could be explained on this basis. Subsequent investigations have not confirmed the latter assumptions. Ewing felt that the basis of this disorder may be due to delayed myelinization of the auditory fibers, or a defect in the cochlea or auditory pathways. These patients find it difficult to differentiate consonants and unstressed words and syllables. Articulatory errors comparable to the dyslalias were also observed. Comprehension is intact, depending upon the intensity and distance from the sound source.

Psychogenic deafness must also be excluded. In such cases the hearing loss is not consistent and the speech impairment is greater than that demonstrated on the audiometer. The use of the hearing aid in such instances is usually unsatisfactory from the standpoint of correction.

*Controversy Concerning Congenital Aphasia*: Freud (**25**) clearly recognized the differences betwen the loss of speech in childhood and adulthood in that aphasia could be said to exist only after the normal acquisition of language. This process was regarded in the holistic rather than the regional sense in relation to localization.

Allen (**1**) states that although it is conceivable that delayed speech in children could be due to a local cortical defect as in adults, he had never observed such an instance. Coen and Thomas are quoted as describing pathological examples of the latter type, but the original references were

not given. Allen cites the most common type of this delay as being the result of cerebral palsy.

Opponents to the use of the term congenital aphasia indicate the absense of autopsy confirmation corroborating such claims and that present concepts obviate the previous theories of strict localization of cortical function as pertaining to language behavior. There is also good reasoning to the objection that aphasia in the ordinary sense implies destruction of a previously existing social, intellectual, and cultural process already well established. Further, the methods of examination as used in adults are not applicable to children as they depend to a great degree upon verbal stimulation and performance. Scales such as the Grace Arthur, Kuhlman-Binet, Porteus maze, etc. which depend upon a psychomotor response have been used but are not entirely satisfactory. The reliability of these tests, which are actually intelligence examinations, is more valid if checked one against the other as shown by Doll (**19**), Arthur (**2**), and others. It is unfortunate that a level is necessary at these particular age groups, as it is well known that the younger the child when tested or the longer the interval between examinations, the poorer the predictability as to the patient's ultimate status. This is especially true prior to the age of one and one-half years, and continues in descending frequency to the ages of four and five. The association of language and intellectual function is even more apparent when results show the increasing predictability of levels of intelligence after the acquisition of speech. However, it is to be pointed out that even though we use the performance in lieu of the verbal test, they are not equal, and the real predictability of the former is yet uncertain. Notwithstanding data of this type, such methods of examination even at early levels serve as a useful instrument and guide in the absence of a more reliable procedure.

Factors in favor of retention of the term congenital aphasia in the presence of sufficient confirmatory neurological, psychometric, encephalographic, or autopsy data include:

1. Language and its kindred processes are involved in both the congenital and acquired forms, such as reading, writing, calculations, spelling, vocabulary, etc.
2. Intellectual function, abstract behavior, etc., may be impaired in either.
3. Disorders of motility may coexist.
4. Agnosia, apraxia, and other signs of cerebral dysfunction may be present in both types of cases.
5. A knowledge of either condition alone facilities the study and understanding of the other.
6. Principles of therapy are very similar in each instance at different levels, depending upon the etiology, degree and site of pathology, etc.
7. There is considerable resemblance in symptomatology in the two groups, i.e., they may be primarily receptive, expressive, or mixed, etc.
8. Etiological factors may be approximate, such as trauma, vascular, and inflammatory processes, etc.
9. Environmental, cultural, social, educational, and other factors are important in both groups.
10. The term, congenital aphasia is already well known in the medical and educational fields.

It is interesting that Simonson (**72**) concludes her arguments against the use of the designation congenital aphasia with the statement that there is enough in common between the childhood and adult forms to warrant study on the basis of modern aphasia researches.

Blau (**8**) describes three types of developmental language disorders, including stuttering, reading impairment, and motor delay. He also mentions

delayed speech, psychogenic mutism, disorders of articulation and phonation and so-called learning disabilities which include defects in spelling, writing, and arithmetic. Pure forms are said to exist but the mixed type is more common. Although Morgan (**59**), Hinshelwood (**40**), and others have favored use of the term congenital aphasia to cover these defects in a general sense due to their similarity, Blau (**8**) is greatly opposed to such a designation. He reflects that aphasia cannot occur in a child who has not acquired speech as no language exists, and further no clinical, neurological, or pathological evidence of such an impairment has been produced. He is so intense in his condemnation that he states that the use of this term suggests much needless examination and investigation from a neurological standpoint, which further does not add much to the diagnosis and treatment.

The author agrees with this observation in relation to the use of congenital aphasia but does not support his contention that investigations from a neurological point of view are undesirable.

That the term congenital aphasia is still being used may be reflected by a recent title, 'Differential Diagnosis of Aphasia in Children,' by Nance (**62**), even though she suggests that those who might object to this designation could substitute 'idiopathic language retardation.'

### Proposed Classification. Sinlingualism and Cumlingualism

Notwithstanding all the positive correlating data recorded in the previous section, the present general consensus is in favor of discontinuing use of the term congenital aphasia. It is with some hesitancy that a new designation is considered at this time, particularly in that delayed speech seems to fit the general purpose aside from the fact that all other speech disorders have shorter names which are useful when describing these problems. The following table has been compiled in an effort to organize the existing data and includes two additions to the previous nomenclature to denote delayed speech on a neurological basis. 'Sinlingualism,' or *without speech*, as its Latin origin suggests, implies no speech whatsoever; and to designate a child with a similar problem after a few sounds and later words develop, but with still obvious impairment, it is advised that the term 'cumlingualism,' from the Latin *with speech*, be used. Further to clarify these new words, their use is confined to lesions of the central nervous system. Involvement of the peripheral nervous system is designated by other terms as noted on the table.

*Classification*: In the following table, the prefix 'a' is used to imply 'without,' and 'dys' as 'impairment' of the language function in question.

| | |
|---|---|
| 1. Alogia | Mental deficiency: |
| | a. Exogenous: meningitis, encephalitis trauma, Rh factor |
| Dyslogia | b. Endogenous: mongolism, microcephaly oxycephaly |
| | Psychoses: schizophrenia |
| | Neuroses |
| 2. Alalia | Psychological: |
| | Autism |
| Dyslalia | Negativism |
| | Lack of motivation |
| | Inadequate training and stimulation |
| | Bilingualism |
| | Changes in affect |
| | Socio-economic status of parents |
| | Multiple births |
| | Age of associates |
| | Types of experience |
| | Family attitude |

| | |
|---|---|
| 2. (Continued) | Physical:<br>Rickets, malnutrition<br>Cretinism, if reversible<br>Structural defects to peripheral speech apparatus |
| Rhino-phono-lalia | Structural defects: cleft palate |
| 3. Aphonia<br>Dysphonia | Structural and neurological defects of the peripheral vocal apparatus |
| 4. Anarthria<br>Dysarthria | Disorders of articulation due to pathology implicating the peripheral nervous system |
| 5. Anarthro-phonia<br>Dysarthro-phonia | Defects of phonation and articulation due to a lesion of the central nervous system |
| 6. Aphasia<br>Dysphasia | Changes in language behavior after the acquisition of speech |
| 7. Stuttering<br>(Aphemia)<br>(Dysphemia) | Disorders of rhythm of speech associated with an impairment of affect after the acquisition of language. |
| 8. Anaudia<br>Dysaudia | Defects of articulation due to impaired hearing after the development of speech. |

Impairment or loss of hearing, high frequency deafness, congenital word-deafness, congenital auditory imperception, etc. are classified with sinlingualism and cumlingualism with associated qualifying terms when found to be due to a developmental central nervous system lesion.

| | |
|---|---|
| 9. Sinlingualism | Arrested development of speech due to a lesion of the central nervous system |
| Cumlingualism | Impairment of speech due to developmental language delay on the basis of central nervous system pathology |

These terms are qualified in relation to demonstrable pathology such as:

a. Cerebral: frontal, parietal, temporal
basal ganglia
b. Cerebellar, pontine, medullary
c. Cerebro-cerebellar

These designations are further modified depending upon the language and social behavior of the individual, e.g., whether there are defects in expression, comprehension, pathological behavioral deviations, etc. As the speech mechanism is initiated, whether spontaneous or accelerated by adequate therapy, defects in rhythm, articulation, and phonation may be present, as well as retardation of the associated language processes, such as writing, reading, calculations, etc. The terms agnosia, acalculia, alexia, agraphia, etc. which have previously been applied to adult problems might be applied here if preceded by the designation 'developmental.'

## Summary

This paper has been confined largely to a historical review of the various neurological, terminological, and etiological concepts concerning speech behavior. The controversy over the use of congenital aphasia and audimutitas for cases of delayed speech has been described and two new terms have been suggested. These are sinlingualism and cumlingualism, the former

denoting absence of, and the latter, impairment of speech, on a neurological basis.

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# Speech and Hearing Programs as Seen by the United States Office of Education

Elise H. Martens*

THE section on Education of Exceptional Children and Youth is particularly interested in the education of all children and young people who have special needs because of a serious physical, mental, or emotional problem. A hearing loss is such a problem. So is a speech handicap, whether it be of physical, neurological, or emotional origin. So also is seriously defective vision, a crippling condition, epilepsy, a cardiac or other organic disorder requiring an adjusted school program, extremely low intelligence and very high intelligence, an emotional disturbance or a behavior that results in pronounced maladjustment.

For lack of a better term, children giving evidence of any of these problems to a marked degree have been designated as 'exceptional,' because they differ from what is supposed to be normal to such an extent that they must have special educational attention. The United States Office of Education tries to help meet the needs of all of them—very inadequately, to be sure, because of the limited staff and funds available. Yet its responsibility is to cover the entire field in research, consultative service, publication, and any other appropriate activity. To date there is no technical expert in speech correction on the staff, nor any one especially prepared in the education of the deaf. Consequently, for the present the service must be broad, practical, promotional, and fact-finding in these areas.

The Office of Education has seen over the past 15 or 20 years a phenomenal growth in the organization and maintenance of special educational facilities for exceptional children on both a state-wide and a local scale. Whereas in 1930 only 11 states boasted of a supervisor or director of special education within the state department of public instruction, in 1948 there were 34 states with such a program, plus the District of Columbia and the Territory of Hawaii. Special education for exceptional children includes speech correction. It includes also the education of the deaf and the hard-of-hearing. Speech and hearing programs in the schools have grown as the tota! educational program for all exceptional children has grown. State laws, state financial support, state standards, and state certification have proved most effective when they have encompassed and recognized the needs of all groups.

The value of thus integrating educational programs for the acoustically handicapped and the speech defective in the schools with the entire special education program for all exceptional children is a demonstrated fact. In 1930, as reported by the White House Conference on Child Health and Protection (**3**), 60,000 children were receiving special instruction for the correction of speech defects; and 18,212 deaf and hard-of-hearing children were enrolled in special schools and classes organized to give them the type of instruction they need. These figures agree very closely with those gathered by the Office of Educa-

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tion for the same period. Preliminary figures now being compiled by the Office of Education for the year 1947-48 indicate that the number benefiting from special instruction in these two areas together is from two to three times the number reported in 1930—and this despite the depression of the 30's, the wartime tragedies, and the postwar shortage of teachers. The greater gain has been in the field of speech correction uncomplicated by a hearing loss. Progress is being made, but the goal of an appropriate educational service to *every* child is still far from achievement.

The Office of Education sees this growth in special education as the result of a number of factors. The need of manpower for military purposes has concentrated attention upon the importance of developing the potentialities of *every* man, regardless of capacity or handicap. The aftermath of war has forced upon us the tragic need of caring for the halt, the lame, and the blind. The developing public consciousness of the importance of providing total security for *all* children, including the handicapped, has been another contributing factor. Federal authorities, state legislators, and educational administrators all have had a part in promoting the program in one way or another. Of particular importance, from the point of view of education, is the fact that some 30 states now have on their statute books laws authorizing special educational facilities for physically handicapped children, including the speech defective, and granting to local school districts special financial aid to meet the extra cost involved. Only within the past five years, seven or eight states have been added to the list, and others are contemplating legislative action in 1949. This indeed is encouraging progress.

How many children should ultimately be served in this way? How extensive is the problem anyway? The Office of Education has studied this matter very carefully, weighing all the evidence turned in by various surveys and estimates made throughout the country. Every specialist is eager that the magnitude of his particular field be fully understood—and that is as it should be. Yet both economy and efficiency demand discretion and reason. The White House Conference of 1930 provided an accumulation of figures that at first sight seemed to mark about 40 per cent of school children as definitely handicapped in one way or another. But in its summary the Committee on Special Classes of the White House Conference stated (**3**) that: 'there are more than 3,000,000 children in the elementary schools of the United States who require special treatment and training to make the most of their possibilities.' This number is considerably smaller than the 10 or 12 millions which would comprise the 40 per cent indicated as having some degree of handicap.

Since that conference, the American Hearing Society has clarified the figures for the acoustically handicapped, previously misinterpreted by some who quoted them, by reporting that, while some 3,000,000 children have measurable hearing losses, only about 400,000 — still too many, to be sure—have losses great enough to require lipreading instruction (**1**). Similarly, the authors of a recently published book on *Speech Handicapped School Children* (**2**) give the number of speech defectives in the schools (including those with speech defects due to hearing loss) as from five to 10 per cent of the total enrollment, but they recognize, too, that a large number of these can be helped by the regular classroom teacher if she has proper preparation and guidance.

It is not desirable to minimize the problem of special education for any group of exceptional children. It is important, however, to differentiate between a slight defect that can be taken care of by the regular classroom teacher and the more serious defect which demands the personal attention of a speech correction teacher coming into regular contact with the child—

and with his parents. Teacher-education institutions must understand this distinction and provide well-prepared personnel for both groups. State legislators must be made to understand the difference and not be overwhelmed by demands for funds to meet the extra cost involved. School superintendents and supervisors must be informed of the difference. The Office of Education wants to see the speech of *all* children improved as a part of regular classroom procedure. As an integral part of the special education program it wants also to see children with serious defects of speech given all the special instruction they need. For this, special preparation of personnel and specially allotted funds are needed.

THE Office of Education, with the cooperation of the National Society for Crippled Children and Adults, Inc., and with the help of seven selected teacher-education institutions in various parts of the country, is now engaged in studying the opportunities offered for the preparation of teachers of exceptional children, including, of course, the speech handicapped, the deaf, and the hard-of-hearing. It is still too early to quote figures, but one of the most significant findings coming out of the study is the widespread interest in offering courses in speech correction as a part of the college curriculum. In many institutions such courses are offered within the department or school of education. In others there is a separate department of speech, in which speech correction is a recognized entity. In a few, speech correction is offered under clinical psychology; and in a few others a recent development places it in the medical school. This diversity of administrative practice places upon us all the great responsibility of seeing to it that the program of teacher-education is well coordinated. Prospective teachers interested in speech correction may well become confused and have a hard time fitting the speech correction courses into the total scheme of things unless they are properly guided through a counseling program, with understanding teamwork on the part of the instructional staff.

In teacher-education the need for differentiating is again apparent. The training program for the teacher who wants to go into regular classroom work and needs a general orientation in speech and hearing is quite different from the program for the person who wishes to specialize for public school work in either speech or hearing, or in both. They all need to know the principles of educational procedure; they all need to meet state standards of certification; they all need to understand children and to know how speech correction can fit into the general curriculum; and they all need to have a knowledge of the fundamentals of speech and speech improvement. From this point their paths would seem to diverge—the one group advancing into the more highly specialized techniques of speech correction or of teaching the acoustically handicapped, the other advancing into the equally specialized techniques of classroom teaching in the elementary or secondary school.

A large number of teacher-education institutions offer only one—or at best a few—courses in speech correction. A smaller number offer what might be termed a minimum sequence in speech correction; while relatively few make possible an all-round preparation, with laboratory and clinical experience. Perhaps this is as it should be. Perhaps the needs are: (1) a few well located, well developed centers in which a highly qualified staff is available to prepare specialized teachers and clinicians, and (2) the inauguration of an orientation course or courses in every teacher-education institution to assist classroom teachers to understand, identify, and alleviate some of the minor speech problems. At any rate, the whole teacher-education program must be carefully thought out. The American Speech and Hear-

ing Association has a great opportunity and responsibility in helping to guide it aright.

Diversity likewise exists in the terminology used. The field in which the work is done may be: speech correction, remedial speech instruction, speech rehabilitation, speech reeducation, speech therapy, speech pathology. If the person working in this area is allied with the medical field, he is likely to be a 'therapist.' If he is working in a psychological clinic, he is a 'clinician.' If he is working in the schools, he is a 'speech correction teacher.' There is no real harm coming out of such diversity, if all understand one another's point of view, one another's strengths, one another's weaknesses, and one another's contribution to the total program. It simply means that doctors, psychologists, and educators are all recognizing the importance of the problem and their opportunity to help solve it.

'Teamwork' is stressed over and over again in all our special education programs. And teamwork is just as essential in the speech and hearing programs as in other areas. No discipline—medicine, psychology, education, or speech (if that is a separate discipline)—can claim that it has the sole or the best solution. No one of them may demand that *every* worker in the field must conform only to its requirements and to no others. There may be differentiation of emphasis, and differentiation of requirements, too, depending upon whether the worker is in the school or in the clinic outside the school. But there must be identity of goal—the correction of speech defects in every child, and the education of every child with defective hearing. To achieve this goal all must work together.

The tremendous need for research in all phases of the speech and hearing areas is apparent. Scientific evidence is needed to evaluate methods, to appraise results, even to identify problems. Governmental and private agencies both can make most valuable contributions to this end if adequate resources are available and coordination of effort is achieved.

In summary, as seen by the Office of Education:

(1) There has been a phenomenal growth in special education for handicapped children over the past 20 years.

(2) The integration of speech and hearing programs in the schools with the total special education program for all exceptional children has contributed to this growth.

(3) There is need for defining the problem in terms of the severity of the handicap, with due consideration of the service that the regular classroom teacher can give with a minimum of specialized guidance.

(4) Teacher-education programs must be guided so that they will be well-balanced, well-staffed, and well-directed.

(5) It is important to recognize the contribution that each of several disciplines may make to the total problem of speech correction, and to work with mutual understanding and cooperation.

(6) Every phase of the speech and hearing areas cries out for intensive and well-coordinated research.

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# A Speech and Hearing Program for Children in a Rural Area

Harriet M. Dunn*

THE establishment and maintainence of a state-wide speech and hearing program in a state where population is widely scattered and there are few centrally located cities presents many problems. Vermont is such a state. It has an area of 9,529 square miles and a school population of 70,117. Of this number only 15,418 children live in the eight cities. The rest, over 54,000, live in villages or on farms and attend small country schools. The way in which these problems are being met in Vermont may provide suggestions for those working in similar rural areas.

A study of the location of schools revealed that a state-wide speech and hearing survey would be expensive and time-consuming. Rural Vermont has few so-called 'consolidated schools' where large groups of children are brought by bus to one central building. The geography of the state is one factor which prevents such centralization. The mountain ranges extend north and south and on their slopes or in the valleys between the highways go in those directions also. Another factor is the division of counties into towns which are individually responsible for setting up and supporting their own school systems within their boundaries. So Vermont schools are small, consisting of one or two rooms, and long ago were built in locations which seem inaccessible to outsiders, but they serve very well those families who live on the back roads and lanes of those areas.

Following the study of the school population it was decided to visit the homes and schools, when necessary, of children with hearing disorders who had been referred to the medical social worker of the Vermont Association for the Crippled. It took two weeks of carefully planned travelling to see these 25 cases of pre-school and school age children who had been refered by doctors, schools, and various social and health agencies. It was easily recognized that time lost in travel plus the unsatisfactory examination at home without equipment and without pediatric and otological examinations made this way of handling the problem infeasible.

A study of the resources and the health and social agencies of the state which might aid in setting up a program proved more profitable. Individual and group conferences were held with the Dean of the Medical School of the University of Vermont, the Commissioner of Public Education, the Commissioner of the Department of Social Welfare, the Director of Services for the Deaf, the Director of the Crippled Children's Division, the Supervisor of Public Health Nurses, District Superintendents of Schools, leading otologists in various areas, and with heads of various social agencies. At these conferences such questions were discussed as these: (1) what geographical center could offer hospitals or clinics for medical diagnosis and after care, (2) how can the children be reached most efficiently with the least loss of time in travel, (3) how could children be transported to these centers of ex-

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amination, (4) who would choose the children with speech and/or hearing disorders to be transported to such centers for examinations, (5) how could such diagnoses be followed by medical care, ear care, speech training, lip reading, auditory training, the counselling and guidance of parents, and (6) what financial responsibilities for care could be assumed by the association.

A coordinating committee composed of representatives of the above named departments and agencies acted as a clearing house and planning group. Meetings were held at intervals and inter-agency functions were clarified. These meetings were of great importance because they gave to the members an awareness of the creation of new facilities and thus duplication of services, with its consequent waste of time and money, was avoided.

Out of the study of the State of Vermont as to topography and population, and the many conferences with persons in a position to give counselling and guidance has grown a state wide *demonstration program*. For the present the association is able to study and serve the needs of a large number of Vermont school children with speech and/or hearing disorders, but it does not hope to provide services to meet the total needs in the state. It will remain a demonstration program in nature with one of its main purposes being to convince the departments of public education and public health of the need for an extensive speech and hearing program to reach into parochial and public schools and the private academies of Vermont.

## The Present Program

The state-wide speech and hearing program as it is now set up offers the following services:

(a) Diagnostic speech and hearing clinics held weekly in four cities so situated as to be accessible to rural areas.

(b) Follow-up work including payment for certain types of medical care, providing transportation to classes, help in solving certain social problems.

(c) Classes in speech correction and auditory training three days each week at the Center in Rutland.

(d) An eight week intensive training program in a summer residence center for children with speech and/or hearing disorders.

(e) Training of parents to work with the children previously examined at a diagnostic clinic by demonstration of techniques, periodic conferences, and by providing carefully prepared directions, lesson plans and materials.

(f) Training teachers to supplement the work done by the parents of the above-named children, or to do the work themselves in conjunction with the daily routine and procedures of the regular classroom.

(g) Periodic rechecks with further recommendations of children examined in weekly clinics, children who attended camp, and children being taught at home by parents or teachers.

*The Diagnostic Speech and Hearing Clinics*: The weekly diagnostic speech and hearing clinics were planned under the guidance of the Dean of the Medical College of the University of Vermont. The first clinic to be set up was in Burlington. It offers relatively complete medical facilities. The staff of this clinic is composed for the most part of heads of departments of the faculty of the Medical School and College, and the two speech therapists and medical social workers of the Vermont Association for the Crippled. The other three clinics are modeled upon this one but offer fewer medical facilities because of their location.

Children with speech and/or hearing disorders are referred for examination at these clinics by parents, teachers, doctors, nurses, social workers and interested adults. Such information as is received about the child is then registered with the Vermont Central

Index, which in turn provides known facts about the child and his family and a list of state institutions and agencies to which they are known. The medical social worker then writes to the institutions or agencies so listed for summaries of their findings. The purpose of this is to avoid duplication of services and to provide a fund of information with possible bearing on the speech and hearing problems. To the parent or guardian of each child is sent a questionnaire which when completed gives a picture of the complaint, the medical, developmental, and social history of the child, and of his family. Two unusual but very useful requests on the first page are: (1) frequency of mail delivery and (2) directions for reaching the home. Answers to these tell how much time is needed to get word by mail to an isolated farmhouse or a home in a small village and how to reach that home if and when a home visit is necessary. Travelling on some of the back roads is often difficult and asking directions to a house involves much time.

When the completed questionnaire is returned, an appointment date for the clinic in the nearest city is given. A clinic day in Burlington proceeds somewhat in this way: At the appointed time the child in the company of a parent, social worker, nurse or school superintendent arrives at the college infirmary ready for a round of examinations, which takes from two to three hours. Each child is examined by a pediatrician, otologist, neurologist, orthodonist, and psychologist, in addition to two speech therapists who give an audiometric test and make an analysis and recording of his speech. One of the speech therapists also talks with the parents or persons bringing the child and it is frequently necessary for the social worker to spend some time with them.

A staff meeting presided over by the director of speech and hearing services follows the clinical examination, and at this each case is reviewed in turn and recommendations are made, discussed, challenged or agreed to, and a conclusion is reached. This is the time when learning takes place on the part of the examining staff as the contributions from each field are explored. Following this meeting a letter summarizing the reports and recommendations of the examiners is written by the speech therapist. Follow-up on medical care and social problems not including speech is done by the medical social worker. Follow-up on speech and/or auditory training is done by one of the speech therapists.

Clinic days in the other three cities proceed much as this one although fewer medical examiners are present. Since medical facilities are concentrated for the most part in and around the Medical College, special problems found in other clinics are taken to Burlington at some future date for further evaluation.

*Follow-up Work*: The follow-up for the purpose of carrying out the recommendations of the examining staff, both as to medical care and speech and auditory training, is carried out by speech therapists and the medical social worker as follows:

Certain types of medical care and transportation to medical centers and to the center for classes are provided when necessary by the Vermont Association for the Crippled through the medical social service department. Speech training, auditory training, with guidance and counselling on the personality adjustment and educational problems are conducted by the speech therapists.

*Group and Individual Classes in Speech Correction*: Group and individual classes in speech correction and auditory training are held at the Center in Rutland three days each week. Children come from a radius of 50 miles by bus, train or car. Parents are encouraged to accompany the children, and it is now an established custom for the parent to sit

in on the last 10 minutes of each class. This is the time when assignments are given for projects to be carried out at home and school. The parents of preschool children are present for the whole class, watching, participating, and learning how to carry on like activities at home. Through arrangements with school superintendents, teachers are encouraged to visit classes in order to learn better how to carry over newly learned speech patterns into school situations.

*Summer Residence Center with Intensive Training*: Each summer children from the 14 counties of the state, work, play and live together for eight weeks at a residence center. Group and individual classes are held from five to six hours a day with recreational and rest periods interspersed as found best for various individuals. Mothers and teachers of the children serve as house mothers, attend classes and have weekly meetings with the speech therapists to discuss the carry-over of newly learned techniques to the home and school situations.

*Training of Parents and Teachers*: While direct speech and auditory training by speech therapists cannot now, and probably for many years will not be provided for all children examined in clinic, in most cases it has been possible to work with the parents and/or teacher of each child so examined. Working with the parents and/or teachers by means of demonstration of techniques used for a particular case, by providing carefully prepared directions, lesson plans and materials and by periodic conferences to chart the progress of teaching has proved feasible and successful many times. We now have about 100 children working under so-called 'untrained persons.' This means that 100 children living much too far away from the Rutland Center to come in for regular classes are being helped by persons whom we are in the process of training to work with them. These persons are parents, teachers and interested adults who have volunteered to try to follow minutely very simple, clear directions and be so guided in the use of lessons written out rather completely for their use.

We know that at present it is impossible to provide any other type of training. Therefore, we have found it necessary to explore thoroughly the possibilities of using the child's own mother or teacher as a 'speech teacher,' in order to effect changes for the better in speech production, plus changes in home and school environment to prevent further maladjustments. We know full well that a teacher's skill is as important as the materials and lesson plans given to her. We know also that the lesson plans and materials as directed can bring the desired results only so long as the teacher presents them in a way to provide motivation. We realize also that the teacher must be able to adapt some of the lessons to fit individual needs of age, attention span, interest and ability. She must in addition to all this learn to evaluate competently the speech production. Some parents and teachers must assume the role of speech teacher in rural areas, but they are working under guidance and supervision.

The lesson plans are based upon conversation or social patterns in the daily speech situations in the lives of children. For example when teaching a *th* sound it is put into and first taught in the one useable response 'thank you.' In teaching an *f* sound a situation is set up which elicits the response 'for you' or 'for me,' and 'yes' is used when teaching an *s* sound. Uses for such responses can be found immediately at home or at school and when, by continued use, they have been learned, a transfer to other patterns follows more easily. Teaching of this sort demonstrated in the clinic to parents and teachers gives them something specific to do, which they are able to carry out in their contacts with the child. Most of them have had

real success in their efforts and have shown eagerness for continued guidance.

*Periodic Rechecks*: To evaluate the results obtained by the above method a careful check is kept on the progress of each child through monthly reports and letters, by monthly rechecks and recordings made at clinic centers or during home visits. For example, with each set of lesson plans goes a report blank which must be filled out and returned before additional plans are sent out. It sometimes has taken a period of months to educate some persons to the importance of this report, but by persevering it is usually forthcoming. The report is not only an indicator of the progress of the child but also serves the purpose of showing how well the teacher is doing.

## Conclusion

The establishment of a state-wide program in speech re-education and auditory training in an essentially rural state can well be called 'country practice.' The many allied and supportive facilities of medical, social and health agencies, education, child development and guidance centers are not present to the degree in which they are to be found in great urban areas. In urban localities a nucleus is usually present which can be called upon to support a new program. As in many rural states, no such nucleus existed in Vermont.

It so happened that in Vermont certain conditions were favorable. Speech and hearing services were wanted and needed. The Dean of the Medical College had a particular interest in these services, and from his viewpoint as a teacher he lent his interest, integrity and influence to further the planning. In addition there was a private agency with small but available funds for the establishment of a program.

There were, and still are, many 'stone walls' to be circumnavigated, broken down, or crossed by a stile. But awareness of the needs has been established in the hearts, minds and pocketbooks of Vermont citizens. A question often asked by New Englanders is, 'Will it wear well?' This applies to a house, clothing, a car, or even to a speech and hearing program. The precedent of special education for rural children has been established and will remain because the program has produced tangible results.

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# Measurement of Progress in the Correction of Articulatory Speech Defects

Kenneth Scott Wood*

THE purpose of this article is to discuss a method for the quantitative description of a person's ability to articulate consonant sounds correctly. If a standard can be set up, defects in articulation can be quantitatively represented, and degree of progress in correcting them can be quantitatively measured.

In a recent study (3), the author presented a system of determining an *articulation index* for the purpose of measuring the progress of corrective procedures and subjecting such measures to statistical treatment. The purpose here is to explain in more detail the rationale of the *articulation index* in the hope that it may be of use to other workers in the field.

Ranking in close order to the problem of how to obtain progress in speech correction is the problem of how to measure degree of progress. Regardless of what system of measurement is used, in the final analysis the determination of speech improvement will rest on subjective auditory judgments. It is easier for the speech correctionist to determine when normal speech has been attained than for him to analyze and determine intermediate progress. The application of a quantitative method of measuring improvement in articulation cases is facilitated by the fact that the immediate concern in such cases is a certain number of recognizably different and distinct consonant sounds. The correctionist is trained to analyze the person's speech in terms of these consonant components as they appear in continuous speech. By listening with trained ears he can locate the points of error, and he can describe the adequacy of speech in terms of sounds produced accurately or inaccurately.

If we wish to count the number of consonant phonemes which a person produces correctly in his stream of speech, we derive a rough numerical evaluation of his articulation ability. In doing the counting, however, we have to realize that the ability of the subject to produce sounds in isolation, in syllables alone, or in words alone is not enough to indicate that he has an auditory concept of those sounds and real mastery of them. His ability to produce accurately the sounds in isolated words in response to a picture or object is often representative of his ability to utter those sounds correctly in continuous speech, but not always. No matter what kind of articulation test is used, the final test is whether or not those sounds are consistently produced correctly in the stream of spontaneous speech.

The fact is recognized here that speech does not consist of the sum of its components but is a product of the whole person. It is clear, however, that speech can be analyzed in terms of sounds and that consonant sounds play the most important part in the intelligibility and social competence of speech. When we measure articulation ability in terms of these consonant

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TABLE 1. Relative values of consonant sounds used in calculating the articulation index.

| *Sound* | *Total Rel. Value** | *Initial* | *Medial* | *Final* |
|---|---|---|---|---|
| [p] | 2.8 | .93 | .93 | .93 |
| [b] | 2.9 | .97 | .97 | .97 |
| [m] | 5.2 | 1.70 | 1.70 | 1.70 |
| [t] | 12.0 | 4.00 | 4.00 | 4.00 |
| [d] | 6.3 | 2.10 | 2.10 | 2.10 |
| [n] | 10.4 | 3.47 | 3.47 | 3.47 |
| [k] | 5.1 | 1.70 | 1.70 | 1.70 |
| [g] | 2.7 | .90 | .90 | .90 |
| [ŋ] | 1.9 | | .95 | .95 |
| [s] | 8.9 | 2.97 | 2.97 | 2.97 |
| [ʃ] | 1.3 | .43 | .43 | .43 |
| [tʃ] | .7 | .23 | .23 | .23 |
| [z] | 4.3 | 1.43 | 1.43 | 1.43 |
| [ʒ] | .06 | | .03 | .03 |
| [dʒ] | .7 | .23 | .23 | .23 |
| [f] | 2.4 | .80 | .80 | .80 |
| [v] | 2.4 | .80 | .80 | .80 |
| [θ] | .9 | .30 | .30 | .30 |
| [ð] | 4.0 | 1.33 | 1.33 | 1.33 |
| [l] | 6.3 | 2.10 | 2.10 | 2.10 |
| [r] | 9.3 | 3.10 | 3.10 | 3.10 |
| [j] | 1.7 | .85 | .85 | |
| [h] | 3.9 | 1.95 | 1.95 | |
| [w] | 4.2 | 2.10 | 2.11 | |
| [hw] | .6 | .30 | .30 | |

* From a study by Dr. Lee Edward Travis of the relative frequency of occurrence of speech sounds for children (2).

sounds, we have selected specific criteria which are definitely and directly related to speech as a whole.

Ordinarily the more sounds a person has trouble with the more severe his general speech handicap is considered to be. However, if we wish to obtain a more exact numerical expression and one which will more nearly represent the social adequacy of his speech, we cannot overlook the fact that some consonant sounds occur much more frequently in the language than do others. The person who cannot produce a frequently-occurring speech sound is more socially disabled than if he lacked a speech sound of infrequent occurrence. His speech defect will be noticed oftener by his listeners. Since the relative frequency of occurrence of consonant phonemes is known, certain percentage values can be applied to each phoneme, thereby weighting each one according to its relative importance in the normal flow of speech. Numerical expressions of articulation ability would then be subject to statistical treatment the same as any other quantitative data. Improvement could be expressed numerically as the *articulation index* increases during treatment; measures of central tendency on the part of groups of cases could be determined and comparisons could be made on the basis of significant differences.

Travis (2) studied the relative frequency of occurrence of consonant sounds in the phonetically recorded speech of children, university adults, and adult laborers. Each person's casual conversation was recorded over a three-hour period. The relative frequencies for the three groups were approximately the same. Table 1 presents the relative values for each consonant sound as obtained from the group of children, and they serve as the basis for the *articulation index*.

The *articulation index* is the sum of

the relative values of each consonant sound the person is able to produce correctly in continuous speech. If he could produce them all correctly his score would be 100. If he were able to produce every sound correctly except [t], his score would be 88.0 because [t] accounts for 12 per cent of the consonant sounds occurring in the language.

In determining the number of consonant sounds which occur in continuous speech the fact must be recognized that most of the consonants occur in three different positions: initial, medial, and final. Six consonants occur in only two of these positions. Regardless of the position in which the consonant occurs, it is still essentially the same sound, even though there are enough acoustic differences to justify looking at them as partially separate sounds.

Many articulation cases learn to produce a consonant in the initial position before they learn to produce it in other positions. As indicated in Table 1, the relative values for each phoneme are prorated equally to the two or three positions in which the phoneme occurs. The purpose of prorating these relative weights in determining the *articulation index* is simply to allow numerical credit for the partial learning of a consonant sound; that is, learning to produce it in at least one of the positions in which it occurs. If the person under treatment learns to produce the sound in all of its positions, he would receive credit for the full relative value of that sound.

The equal prorating of each relative value to each position in which the sound occurs is questioned by Henrikson in a recent article (**1**) dealing with the validity of the *articulation index*. Henrikson concludes:

> 1. The rank order of frequency of occurrence of consonant sounds in children's speech presented by Travis corresponds approximately with the order of occurrence found in this study.
> 2. Prorating consonant sounds on the assumption that they occur equally or approximately equally in all positions in a word is not justified.
> 3. Using such a prorating as the basis for constructing an index of progress is not justified, and the value of conclusions drawn from using such an index is correspondingly questionable.

Henrikson's study shows rather clearly that consonant sounds do not occur with equal frequency in all positions in a word. This fact was considered when the *articulation index* was first set up and used to compare the progress of two groups of articulation cases (**3**). The equal prorating was not done on the assumption that there was equal frequency of occurrence of consonants as to their positions. It was done because of the near impossibility of determining the relative frequency of occurrence of the various positions of consonants in continuous speech. For example, Henrikson found that his group of children produced [t] 449 times in the initial position, 410 times in the medial position, and 1064 times in the final position. What he apparently did was to count 449 words in their speech which started with [t], 410 words with [t] in a medial position, and 1064 words which ended with [t].

The point should be raised, however, that consonants are easily sorted from word units into initial, medial, and final sounds, but these figures do not represent the actual positions of the sounds as they occur in continuous speech phrases. A final [t] in one word may become a medial [t] when that word is used again. For instance, the final [t] in the sentence, *Gimmie my bat,* is not a final [t] in the sentence, *Leave my bat alone,* even though it occurs in the same word. Whether or not the [b] in *bat* is an initial sound will depend upon the way the sentence is said. If every word is emphasized in a certain manner, it may occur initially; but if *my bat* is said quickly, the [b] will occur medially. Initial and final consonants in words tend to become medial when words are combined in the phrase units

which characterize speech. The length of word groupings varies from person to person, and it varies for the individual in relation to shades of meaning, emotional states, and social situations. That Henrikson's frame of references is one of isolated words instead of continuous speech is seen in the statement of the second point in his conclusions just quoted. Since the determination of the relative frequency of occurrence for each position of a sound is not at all comparable to the standardizing of the relative frequency of each phoneme, arbitrary equal division was made.

Still another factor necessitates the equal prorating. It has been observed that a person who learns an initial [t] has in part learned the medial and final [t] even though he has not at a given point developed the ability or habit of producing it in the last two positions. Since it would be impossible to tell how potentially close a person has come to producing a correct sound in one position as a result of learning it in another, there seems to be only one solution, namely, to prorate the value equally among the three positions. The assigning of relative values to each consonant phoneme is fairly simple in view of their separate and distinct entities, but assigning relative values to each position in which they kaleidoscopically occur in the variegated patterns of continuous speech is impossible because such values are not stable.

In summary, if the person's articulation ability is quantified in relation to the frequency of the speech components he hears and the frequency of the components he must therefore learn to produce, his progress in overcoming articulation difficulties can be designated numerically. This is believed to be superior to the method in which all sounds are given an equal value. Since relative frequencies of occurrence for phonemes themselves are vastly more stable than the relative frequencies of positions in which they occur, it does not seem logical to attempt a relative apportionment of numerical values below the level of the speech-sound as a unit.

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# LETTER TO THE EDITOR

The new year of 1949 started off for me with the following letter from a good friend who is a speech correction supervisor. There seems no point in merely filing it away out of sight. I'd like to share it with as many others as possible:

'A couple of weeks before Christmas a teacher related to me the following sad tale:

> In our schools we have a speech correctionist who comes once a week, takes the children out to a special class for 30 minutes. I did not send a little girl, 6½ years of age, from my first grade, because she has spoken perfectly all year and *does not have a speech defect.* But her mother called the principal about her and the speech therapist came to my room to get her. 'Why?' I asked. 'Because she stutters,' the speech teacher replied. 'But she has *never* stuttered yet in school!'
>
> The speech teacher insisted it would please the mother to have her child getting the advantages of the speech correction program, so I sent the child to the speech clinic. When she returned we heard her falter and hesitate for the first time in her classroom. The following week I sent her again. Upon her return we were having a 'sharing' period about Thanksgiving experiences. This little girl got up as usual, began with a smile, then blocked completely on the word 'turkey.' She struggled for quite a while, then she broke into tears and sobbed to her classmates, 'I can't say it because I *stutter*!'

'You will fully realize how I feel about such a crime being committed under the name of speech correction. The pity is that thousands of kids across the country are being sent to such special group classes, the mere attendance, even if the word "stutter" is never used there, being sufficient to create most unfortunate disturbances. I related this incident at a meeting last week, and one teacher asked me how else it could have been treated!

'Of course the problem in this case is, as usual, that average daily attendance in the corrective speech classes is the basis for financial reimbursement to the local district by the state. Had the speech therapist visited the home and treated the causes there where the stuttering appeared she could not have counted her time for excess cost reimbursement. She can count her time only if she spends it with the child, not if she spends it with the parents. Where are we going to wedge in with some revolutionary and drastic revisions of such static concepts of speech therapy?'

—WENDELL JOHNSON

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# Book Reviews

Ernest H. Henrikson, Editor*

BATHURST, EFFIE G. *Schools Count in Country Life.* Washington, D.C.: Government Printing Office, 1947. Pp. 57.

In what ways can rural schools improve rural living? After raising this question the author answers it by citing numerous examples of ways in which rural schools draw their subject matter from the communities which they represent. Many of the activities described in the bulletin are found only in the better schools. They do not necessarily represent the entire curriculum. They do present very effectively ways of meeting certain needs of children growing up in the open country and in small towns. At the close of the bulletin a bibliography serves to introduce one to additional publications dealing with the improvement of rural life through its schools.

A final test of the value of the school to the community, from the point of view of this bulletin, consists in progress in such things as: the food habits of children; conservation of soil, wild life, and other natural resources; home beautification; enrichment of the social and recreational life of the community through music, dramatic production, and the development of the spirit of cooperative community living, etc. As one reads through the bulletin he is impressed with the fact that he was born too soon.

This bulletin should be on the book shelf of every one who is interested in rural life and education. Certainly this should include the person working in speech correction, who will have many cases either in or from the rural areas.

J. B. PAUL
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BLUEMEL, C. S. *War Politics and Insanity.* Denver: World Press, 1948. Pp. 117.

The author of this book is well known to speech correctionists. His books on stuttering and related speech problems have been studied by all well-trained students in this field. In this volume he addresses himself as a neuro-psychiatrist to the broad and grave problems of the role of disruptive personalities in politices and government. The aspects of personality which he singles out as most significant is this connection are social dominance, aggressiveness, obsession and compulsion, and he asserts that they are most dangerous when combined. With reference to this cluster of reaction tendencies, Dr. Bluemel reviews the personalities and careers of such historical figures as Gandhi, Stalin, Hitler, Mussolini, Cromwell, etc., appraising the effects of their personalities on the course of human history.

Perhaps the most interesting chapters for most readers are the final three, in which Dr. Bluemel discusses democracy, with particular reference to the influences on the democratic process of disordered personalities of political leaders. He closes his discussion with an outline of a form of government which is 'selective rather than elective.' In this recommended form of government only 'Senior Citizens' may vote or deal responsibly with public affairs. A Senior Citizen must be at least 40 years old, must have a university education with studies in 'history, economics, psychology, and related subjects,' and be 'certified by the faculty as apparently free from abnormal traits of personality, such as paranoid trends, depressive moods, and undue aggressiveness.' The personnel of government consists exclusively of senior citizens and they rule by decree.

What Dr. Bluemel adds to Plato's *Republic* is a provision for the elimination from government of individuals with personality disorders or abnormal tendencies, as these might be determined and evaluated in the light of modern psychology and psychiatry. He does not indicate which of the American Presidents and candidates for the Presidency since 1900, say, might have been disqualified under his system. Dr. Bluemel presents his plan of government in five pages. A full context for these five pages would be a not inconsiderable treatise. In the meantime, it is hardly likely that many will disagree with the sentiment and aspiration voiced by Dr. Bluemel: 'When the world is governed by normal men it will cease to be the arena of the battle captains and men will live together in peace.'

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FIELDS, VICTOR ALEXANDER. *Training the Singing Voice.* New York: King's Crown Press, 1947. Pp. 337.

This book is intended to draw together and make available to the teacher material on singing and voice culture which is 'extremely diversified and fragmentary and rather diffusely distributed throughout a variety of books, periodicals, scientific papers, reports of experiments and published interviews that have never been correlated from the standpoint of a definite vocal pedagogy.' Chapter headings under which the material has been grouped are (Concepts of) Pedagogy, Breathing, Phonation, Resonance, Range, Dynamics, Ear Training, Diction and Interpretation. In a final chapter the author adds a number of summarizing conclusions and tables and a list of 97 suggested research problems or areas.

One of the most impressive features of the book is an annotated bibliography of 702 titles on various aspects of voice examined by the writer in the course of his study. The bibliography, it would seem probable, includes virtually all of the English sources related to the author's subject matter and would seem to reflect a very thorough examination of the literature.

No theoretical bias on the part of the author is evident so far as vocal pedagogy is concerned. He states, however, that a conspectus of all the pedagogical viewpoints expressed by authors of texts and articles on the training of the singing voice suggests a predominance of three main schools of thought: (1) The Empiricists, who derive their teaching methods largely from trial and error observations; the main objectives being the attainment of desirable results by whatever means. (2) The Scientific group is composed of those 'who delve into the causes underlying acoustical and physiological vocal phenomena and voice teaching procedures are sought that agree with scientific or experimental findings.' (3) The Natural Method group 'takes a middle path, disclaiming any detailed knowledge of vocal physiology, but seeking to eliminate local effort so that natural vocal reflexes take their course.'

By way of critical comment it may be said that the author has accomplished a very comprehensive review of the literature indicated. The organization of the findings is clear and the presentation is good. There is no effort on the part of the author to evaluate any of the studies or ideas. While this may be consistent with his purpose, some readers are certain to feel the need of critical treatment of the material by the author.

The reader who is concerned primarily with speech correction or even with the training of the normal speaking voice will find much of the material irrelevant to his interests. On the other hand, such persons probably would find at least the chapters on phonation, resonance and breathing worth reading.

JAMES CARRELL
*University of Washington*

GARRETT, ANNETTE. *Interviewing: Its Principles and Methods.* New York: Family Service Association of America, 1942. Pp. 123.

'Skill in interviewing is prerequisite in many types of research and business and professional service,' the author states in her foreword. It is assumed that a speech clinician possesses this skill, but unfortunately many in the field have had little actual training in this complex ability. This small book is designed to acquaint both social case workers and other interviewers with many of the important findings from the field of social case work which can contribute to more effective interviews.

There are three sections in this publication: Part One deals with the art of interviewing, and contains chapters on understanding human nature, the interviewer's attitudes, purposes of interviewing, how to interview, things to look for in interviewing, and the essential conditions of good interviewing. The author grants, at the outset, that interviewing cannot be reduced to a formula, but proceeds to show how skills can be developed through knowledge of the materials outlined. Statements such as these reveal the author's point of view: '. . . . it is seldom possible or essential to understand fully the cause of their (clients') actions. It is essential, however, to realize that their behavior is motivated.' 'The way one feels about a situation is as much a fact as the situation itself.' ' . . . . there are shades and variations of rightness and wrongness.' 'It is easy, when one is treated like God, to assume the characteristics of that role. . .' 'The experienced interviewer will constantly be framing hypotheses as to the basic factors in the case confronting him, testing these, rejecting most of them, tentatively retaining others, seeking further confirmation, and so on.'

Part Two contains annotated interviews from actual experience or selected from books of fiction. The comments given here demonstrate for the reader the application of the previously stated principles and methods.

The concluding section is one of recapitulation, and here the author reemphasizes the difficulty of arriving at the 'golden mean' of good interviewing, and cautions

the interviewer that 'One of the most important skills for an interviewer is a knowledge of his own limitations.'

It appears to the reviewer that an essential part of the training of a good speech clinician should include a considerable emphasis on the interview, and this book could well be a part of the required reading in such a project.

KATHERINE F. THORN
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GREET, W. CABELL. *World Words.* New York: Columbia University Press, 1948. Pp. 608.

Uncertainty about the accepted pronunciation of an unfamiliar word is a recognized deterrent to fluency in speech. In some speakers it produces a hesitancy, even a partial blockage, which with repetition may well lead to serious results.

Probably no group of words is more likely to cause such uncertainty than the personal and geographic names which events force into public attention. Revolution in Costa Rica, war in Indonesia, election of new senators, or even a celebration to which Montevideo, Minnesota invites representation from Montevideo, Uruguay—these may confront one with a pronunciation problem for the solution of which he has only doubtful precedent and ambiguous analogies.

But for 25,000 such terms, including a handful of common nouns with controversial pronunciation such as 'helicopter,' the problem is now happily eliminated by W. Cabell Greet's *World Words.* Greet, Professor of English at Barnard College of Columbia University and editor of *American Speech,* prepared the original list of words as a guide to announcers on the Columbia Broadcasting System, for which he is speech consultant. Highly favorable acceptance led to its complete revision and enlargement in the present form for the general public.

*World Words* contains a brief and linguistically sound exposition of the relation between the principle of usage and the English pronunciation of a foreign name. There is a fairly detailed statement of the principles and phonetic correlations involved in 'trans-pronunciation' into English from a variety of foreign tongues beginning with Albanian and ending with Turkish. There are also a brief bibliography and two keys to the symbols and marks employed to indicate pronunciation. Finally, there is the list of words themselves.

The keys provoke comment. Greet has rejected the example set by Kenyon and Knott, who in their *Pronouncing Dictionary of American English* in 1944 conveniently suggested pronunciation by a slightly modified form of the International Phonetic Alphabet. Apparently he considered the IPA too esoteric for CBS announcers. Apparently, also the two schemes which he does use have been found sufficiently practicable to justify not using the IPA symbol. Yet it is to be regretted that popular acceptance of the IPA has not been furthered by its use here. The first scheme is that of the familiar and inconsistent Websterian diacritics, in which the macron, for instance, represents quality of a simple vowel in 'e,' but a diphthong in 'i,' in which for many American speakers two symbols, 'ä' and 'o,' represent the same sound (the key words being *father* and *odd*), and in which the unmodified symbol 'o' stands for one kind of diphthongal beginning in 'oi' as in *oil* and for quite a different one in 'ou' as in *out.*

But to the Websterian system here used Greet has strategically added schwa (ə), while the other system, described as a 'phonetic respelling without special accents,' has the combination 'uh' for the reduction vowel for which phoneticians use the schwa symbol. This use of the certainly unphonetic 'uh' would not be so misleading if it led only to such uncouth respellings as 'buhr-buhn' for *Bourbon.* But in this system Greet equates 'uh' with the stressed mid-central retracted vowel in *mud, but,* etc., so that the key-word *but* appears as 'buht,' although in his Websterian system it appears as 'but' and not as 'bət.'

This inconsistency leads to further bewilderment because of the representation of the vocalic *r* found in most dialects of American English. Greet himself tacitly admits some inconsistency by representing *urn* as either 'urn' or 'ern' while using only schwa plus *r* for the unstressed vowel in 'fä-*th*ər.' But he leaves the reader to puzzle out just what 'uh' represents when he provides these 'phonetic' respellings for the key-words *father, urn,* and *but*: fah-*th*uhr, uhrn, and buht. Compare the confusing representation of contrasting vowels in 'buhr-buhn' above. And when one sees eight different letter symbols in 'fah-*th*uhr' to indicate the four sounds of [faðɝ], one wishes that the 'phonetic respelling' were somewhat more phonetic.

Even so, users of the book in its original form seem to have found these systems practical, and perhaps one should not cavil too much at this point in light of the admitted value of *World Words* in making available a reasonable pronunciation of question-raising terms. The reasonableness appears in the editor's statement of the

standard for handling newly arrived foreign names, that is, 'to adopt the foreign pronunciation insofar as it can be rendered by customary English sounds in the phrasing and rhythm of an English sentence.' Greet says, 'It is not good taste to introduce sounds that are foreign to English.'

Remarkably inclusive, the book has profited from meticulous labor by Greet and his aides and consultants, so that few moot pronunciations have been ignored. The reviewer has found here all the foreign sticklers in current news reports and even a large number of American place-names and personal names that cause doubt. Detroit, Tucson, Montevideo (Minn.), and La Jolla (Calif.)—all of which have been mispronounced by newscasters recently—might well have been included. But we already have God's plenty in *World Words,* and we may not ask for more.

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ROSSIGNOL, LOIS JOSEPHINE. *The Relationships Among Hearing Acuity, Speech Production and Reading Performance in Grades 1A, 1B, 2A.* New York: Bureau of Publications, Teachers College, Columbia University, 1948. Pp. vii—50.

The purpose of the study presented in this book is to determine the interrelationships of hearing acuity, speech production, and reading performance before hearing acuity reaches its maximum.

The author gives a review of the literature in the field of hearing and speech, in which the writers generally agree concerning the importance of hearing in learning to speak and the tendency for poor speech to be associated with lowered hearing acuity. The opinion of these writers varies, however, concerning the associations between hearing and reading, and between speech and reading.

As stated above, 'the main problem of study was to determine the relationships between hearing acuity and speech production before hearing acuity reaches its maximum. . . The two corollary problems were to determine the relationship between hearing acuity and reading performance before hearing acuity reaches its maximum, and to determine the relationship between reading performance and speech production.' Hearing acuity, speech, reading, intelligence, and oral comprehension tests were given to 229 children in grades 1A, 1B and 2A.

Articulation was tested by using a story, constructed by the author, which contained the major vowel and consonant sounds in the initial and final positions. Pictures were presented at different times in the story and the child's verbal response was to the picture. A further test of articulation involved the presentation of a series of nonsense syllables.

Dr. Rossignol found no significant relationship between hearing acuity and ability to articulate speech sounds in familiar words. However, ability to produce new sound combinations as tested in the ability to repeat sounds in nonsense syllables is significantly related to hearing acuity. Significant relations were also found between hearing acuity and reading performance and between reading performance and speech production.

The significance of the findings of this study, like the significance of all studies, is limited by the groups tested and the methods of testing used. The results have immediate importance for teachers of young children. Further testing involving other groups of children and other methods of testing seems indicated.

A. ELIZABETH MILLER
*Youngstown, Ohio Public Schools*

STRECKER, EDWARD A. *Fundamentals of Psychiatry.* (3rd ed.) Philadelphia: Lippincott, 1942. Pp. 222 + glossary.

This little book, destined to brush up the psychiatry of the general practitioner and to be helpful to laymen, certainly gives a good cross-section of many important modern problems. It stresses wherever possible the modern viewpoints of the dynamic psychology of conflicts, but there are no dogmatic statements on the dynamics of psychoses where such viewpoints cannot yet be borne out. There are useful chapters on psychiatry and war dealing with the influence of the war neuroses on the morale and the handling of overt infringements upon discipline of morale. A few pages on the nursing of psychiatric patients will come in handy. The book can certainly be recommended for orientation.

WLADIMIR ELIASBERG.
*New York City*

WERNER, LORNA SHOGREN. *Speech in the Elementary School.* Evanston, Illinois: Row, Peterson and Company, 1947. Pp. 222.

There has been and is an acute need for simple and helpful speech texts for teachers in the elementary schools. Probably because there has been so little professional analysis of speech as it should be taught at the various elementary levels, because teachers of these grades are so inadequately prepared to understand a complex manual on speech, because there is such broad territory in the development of the elementary school child, and because it is

thought that a speech program should be built to meet the needs and abilities of a particular school or community, a person who presents a speech text for the elementary schools is courageous indeed and deserves to be praised if the effort is an adequate one.

As stated by the author, this book is written for the purpose of offering the classroom teacher: '(1) an explanation of the various types of speech difficulties the classroom teacher may encounter, (2) a discussion of the different types of speech improvement activities which are helpful in the total speech and social development of the child, (3) suggestions for a graded program of speech improvement, (4) units suggested by classroom teachers for the correlation of speech and content subjects, and (5) a selected list of materials for use in carrying on this work.' In a small book of 200 pages without an index and with but comparatively few of many, many usable source materials for elementary teachers, the author attempts to achieve the stated purposes. Let us examine the results.

In 40 pages, 14 of which are taken up with diction selections which are of questionable use for many young children and which are ungraded as to vocabulary difficulty, the author proposes to explain 'Speech Correction in the Elementary School.' The result is rather shallow with important portions, such as prior collection of information, emotional involvements, and particularly just what the classroom teacher can do and must not attempt, receiving very slender emphasis. The following are a few of several statements in this section which may lead to incorrect thinking on the part of a teacher, do a great deal of harm in their assumptions, and show too little or too careless professional insight: 'Such common infantile sound substitutions. . . . . can be eliminated almost as quickly as the child is made to realize that he is not making the correct sound in these words;' 'If a child is obviously immature and does not respond to treatment over a period of months, speech correction might well be postponed until he is more ready to absorb work;' 'Teachers should be able to make distinction between those cases which are pathological in nature and those which are simply functional disorders;' 'If a good repair is effected before a child learns to talk, his speech should be normal.'

The author trys to fulfill the purpose of discussing speech improvement activities by presenting some of the usual games, exercises, and theory of oral reading, debating, discussion, story telling, creative dramatics, poetry suggestions, interpretative speech, choral speaking, and dramatization in approximately ninety pages with sketchy material and with but one visual aid. The apportionment of information is very unequal. For instance, four and a fraction pages are devoted to debate and several types of discussion (omitting the most important and much needed skill—class discussion), while 46 pages are devoted to choral speaking. The treatment of choral speaking and, to some extent, creative dramatics, is the author's best production. On the other hand, the real purpose in somewhat ineffective, for the teacher is not told exactly how the use of a particular activity may improve speech.

The section of the text which deals with a graded program possibly is a move in the right direction, but it lacks sufficient detail. The appendix which comprises speech-teaching situations by individual teachers is most interesting, although quite general in approach, and, the reviewer feels, questionable from the standpoint of being justifiable textbook content. The units as presented seem to imply in several instances that those classroom teachers who are under the author's supervision do not quite understand a remedial speech program.

To conclude, the reviewer believes that *Speech in the Elementary School* cannot be classified as a valuable source in speech. It lacks sufficient professional approach and enough care in scientific analysis. It needs several very important factors to cause it to be a pertinent contribution: objectives in speech for the teacher and pupil at various grade levels, use of activities not as an end but as a means of introducing certain fundamental speech processes, and tests to determine the speech development of the child. It could be improved as an aid in an elementary program if it showed what should be accomplished by the teacher and pupils at each grade level in five classes of materials: organization and content of remedial and diction periods, audio-visual teaching aids, projects for speech, the goals of graded activities, and a definite plan of integration with other elementary subjects.

J. Dale Welsch
*Mississippi State College for Women*

Wood, Alice L. *Sound Games: Speech Correction for Your Very Young.* New York: E. P. Dutton & Co., Inc., 1948. Pp. 103.

Not a panacea, as implied by the review on the book jacket, but certainly an additional aid to speech correctionists is Miss Wood's new book, *Sound Games.* The general principles on which the book is based seem sound. One is that the difficult speech sound should be approached as

something other than speech and yet something familiar to the child, i.e. sound pictures. An example of one of Miss Wood's sound pictures is 'The Ticking Game' in which two children have an unusual clock shaped like a dog's head, and the dog's tongue makes the tick of the clock. The children work out a way that they can make their tongues 'tick' by 'making a dot with the tip of your tongue on the roof of your mouth, just behind the upper front teeth.' Then they are given a vowel sound and asked to precede it with a tick. The instructor is warned not to give the blended form, a warning well worth heeding at this stage of correction no matter what the procedure. This warning is in accordance with the next principle which is, 'A learned reaction to a given stimulus tends to remain constant.' This calls to mind Van Riper's classic example of the child who has finally learned to produce a good *s* and is asked to say *soup* and promptly replies *thoup*.

The book is offered as a help to parents in working with children of pre-school age. It would seem, however, to be asking too much of both the parent and the child to try to remedy speech defects by means of the techniques given in the book. Auditory training might well be started by using the jingles as reading-aloud material, but specific correction, even though treated as a game, creates a situation which is hindered by and hinders the very important parent-child relationship. The parents' place in speech correction seems to be in helping to 'fix' the sound once it has been corrected and can be produced and controlled at will.

Pointers are given to parents in Chapter I: '(1) never use baby talk; (2) if there is a defect in the speech mechanism, try to have it remedied if possible; (3) if a child's speech does not develop normally, an audiometer test should be given; (4) remember that his (the child's) own imperfect speech sounds correct to him.' These pointers should be added to or subtracted from according to the child involved and should not be considered all inclusive.

The jingles in *Sound Games* are much improved over those in *The Jingle Book*, for one reason because they don't seem to strain so to include the desired sounds, and also the word level and interest level is better. The following jingles may help to illustrate the point. They are for the *skr* blend.

A scrawny old wind witch scrambled out
of a dream.
We heard her screech, and we heard her
scream,
Scratch and scrape in the chimney stark
That scrawny old wind witch who rode in
the dark.

—*The Jingle Book*, p. 81.

Scrap was a scrawny kitten
And he used to scratch and claw;
But now he's sleek and gentle
And scrubs his face with his paw.

—*Sound Games*, p. 50.

Although *Sound Games* is without the intriguing drawings found in *The Jingle Book*, the format is pleasant and complements the material.

*Sound Games*, if used and incorporated with other material, will be helpful to speech correctionists. It must be remembered, of course, that a goal of speech correction is to so rebuild the poor speech habit into a good speech habit that it becomes natural to use it in real situations, and that the jingles, if memorized, should not be allowed to sink to the level of tongue twisters but should be used as means to the above-mentioned goal.

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*Milwaukee State Teachers College*

*JOURNAL OF SPEECH AND HEARING DISORDERS*, 1949, **14**, 182-186

# Abstracts

Eugene T. McDonald, Editor*

AVERY, C. Social competence of pre-school acoustically handicapped children. *J. except. Child.*, 1948, **15**, 71-73, 88.

The Vineland Social Maturity Scale was applied to 50 children whose only observable handicap was an auditory defect. Scoring results indicated that these children were normal in social maturity. By means of a second scoring method the children with auditory defects showed some superiority. The author speculates that the apparent superiority of the experimental group, whose scores were compared with the norms for the scale, was due to these factors: (1) The young deaf child attains greater social maturity as compensation for hearing loss. (2) Most of the children studied had been in residential and day kindergarten schools where socialization and self-independence were primary aims. (3) The fact that parents had discovered hearing loss in the children at an early age brought about early application of educational advice. (4) Speech and language seem to play a lesser role in social development of very young children than in older children. (*Kenneth Scott Wood, University of Oregon.*)

CHAPIN, A. B. Parent education for pre-school speech defective children. *J. except. Child.*, 1949, **15**, 75-80.

A parent education program should provide accurate information about the etiology of the child's defect; should teach the parent what normal speech development is; should give parents a clear idea of the corrective methods used with the child; should give the parent an opportunity to observe the child at work in the clinic; and should provide opportunity for group discussion of various speech defects. The author presents the following as objectives of the parent program: To alleviate parental anxiety, to give parents the best scientific information, to remove undue pressure upon the child, and to restore parental confidence in cases where parents feel the case is hopeless. (*Kenneth Scott Wood, University of Oregon.*)

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DICARLO, L. M. An educational program for children with impaired hearing. *Elem. Sch. J.*, 1948, **49**, 160-167.

Education of the child with impaired hearing should be developed from education for the normal child instead of using education for the deaf as a point of reference. This demands a program which will respect the uniqueness of the child's individuality and which will give him social status.

Provision must be made for early, accurate, and systematic detection of impaired hearing together with a program to prevent, cure, and arrest ear pathologies. Each child must be provided with opportunity for maximum individual and social growth through application of compensatory education within the periphery of a normal social environment.

These compensatory differentials will be determined by investigation, evaluation, and recommendation of all attending factors, and not on the basis of classifications which are constructed on audiometric findings. The author discusses seating in the classroom, training in listening with and without amplification, training in visual communication, the necessity for a strong cooperative guidance program, individual tutoring in subjects heavy with language factors, and the major importance of speech and voice training. In reviewing studies of educational problems of the deaf, the author cites 22 references. (*Kenneth Scott Wood, University of Oregon.*)

PUGH, G. S. Appraisal of the silent reading abilities of acoustically handicapped children. *J. except. Child.*, 1948, **15**, 10-14, 32.

A survey was made to determine present status of reading ability of upper-grade acoustically handicapped children. Fifty-six residential and day schools in all parts of the country participated in the study. Reading tests were given to more than 2,500 cases to determine extent of retardation, phases of most severe retardation, extent to which severe hearing loss cases had become efficient readers in spite of their handicap, and factors associated with reading achievement. No evidence was found that reading disability is an unavoidable concomitant of deafness. There

was strong evidence that deaf pupils can become competent readers. (*Kenneth Scott Wood, University of Oregon.*)

TEMPLIN, M. C. A comparison of the spelling achievement of normal and defective hearing subjects. *J. educ. Psychol.*, 1948, **39**, 337-346.

An analysis of spelling errors was made on three groups of 78 normal hearing, 78 hard-of-hearing, and 78 deaf subjects. These groups were matched on age, grade placement, the Pintner Non-language Mental Test, and on sex. The answers written by the subjects to 21 questions concerning physical phenomena such as, 'What makes the wind blow?' were checked for spelling errors. The deaf group misspelled about half as many words as the hard-of-hearing group and about one-third as many as the normal hearing group. The deaf were significantly superior in spelling achievement on three-fourths of the specific words compared.

Previous studies are cited which agree that the spelling achievement of the deaf lies in their superior ability in visual perception of words. According to the author the observed superiority in spelling found in this study is probably due in part to the fact that correct spelling is more emphasized in the training of the deaf. (*Kenneth Scott Wood, University of Oregon.*)

PROCTOR, D. F. Preventing deafness in children. *Amer. J. Nurs.*, 1949, **49**, 45-46.

A deafness-prevention clinic for children in operation since 1943 is described. Patients are discovered through county screening and orientation of medical personnel, teachers and parents. Emphasis is placed on follow-up care. Two cases involving irradiation of the nasopharynx are cited. (*Leo G. Doerfler, University of Pittsburgh.*)

NEW, M. C. Speech in our schools for the deaf. *Volta Rev.*, 1949, **51**, 61-64, 98-102.

The basic factors underlying usable speech are adequate voice, enunciation, pronunciation and sentence rhythm. To achieve these goals, continuity of teaching is necessary through the entire school. The program of the Lexington School is described, including objectives for speech development and improvement in the nursery, pre-school, primary and upper grades. Emphasis is laid upon the 'whole-word-with-meaning approach, using simultaneously the tactile - visual - auditory method.' Stress is laid upon readiness for speech and the use of speech at all levels. (*Leo G. Doerfler, University of Pittsburgh.*)

CAIN, L. F. The teacher and the handicapped child. *Education*, 1949, **69**, 275-279.

Because handicapped children have difficulty in conforming to the conventional school situation, attention must be focused upon facilitating at least the minimum adjustment on the part of the handicapped child. To do this there must be an understanding on the part of all teachers of the child's problems. It is suggested that the special teacher act also as counselor and therapist; that the teacher understand how the child uses his handicap; that the teacher provide integrative experiences with the child's peer groups; and that atmosphere fostering dependency be avoided.

Several specific suggestions are given to all teachers concerning the handicapped. The point is made that mental health for the handicapped child is not basically different from mental health for all children and that the mental health of any child is the first order of business in curriculum building. (*Kenneth Scott Wood, University of Oregon.*)

MORKOVIN, B. V. Growth through speaking and listening. *Elem. Engl.*, 1949, **26**, 129-131, 141.

A child develops the foundation for effective language in the process of speaking and listening. After he enters school, he has to change from an egocentric situation to a new group situation. This change often makes for difficulties for the child, but the teacher can help him to build a balance between 'taking in' and 'giving out' as well as assist him to organize the ideas he receives and those he wishes to express. In this assistance, the teacher needs the help of the parents and also needs to understand the development of the child's language, thinking, and behavior. (*Charlotte G. Wells, University of Missouri.*)

ROBINSON, J. F. What are the trends in child-guidance clinics? *Child*, 1948, **13**, 86-88, 93.

A brief history of child-guidance clinics is given and their purposes discussed. Attention is drawn to the shifting of emphasis on diagnosis to therapeutic methods and to the changing concept of the child. The organization and goals of clinics are outlined. (*Kenneth Scott Wood, University of Oregon.*)

GEWIRTZ, J. L. Studies in word-fluency: I. Its relation to vocabulary and mental age in young children. *J. genet. Psychol.*, 1948, **72**, 165-176.

Based on the following working definitions of word fluency: 'it is involved when-

ever the subject is asked to think of isolated words at a rapid rate; and it is revealed by readiness in producing or manipulating words in accordance with a specified set,' tests for word fluency ability of young children were constructed and administered to 23 boys and 15 girls who had a mean chronological age of 68.1 months (range 5-0 to 6-7) and a mean Stanford Binet (Form L) I.Q. of 126.2 (range 96-162). The relationships existing between these tests of word fluency and chronological age, mental age, number of semesters in pre-school, and scope of vocabulary are reported. The data presented suggests the existence of two abilities in word-fluency. (*Eugene T. McDonald, Pennsylvania State College.*)

GEWIRTZ, J. L. Studies in word-fluency: II. Its relation to eleven items of child behavior. *J. genet. Psychol.*, 1948, **72**, 177-184.

Ratings on eleven items (aggressiveness, cheerfulness, competitiveness, conformity, curiosity, emotional control, emotional excitability, gregariousness, originality, patience, social apprehensiveness) of The Fels Child Behavior Scales were obtained for 38 children whose age range was 5-0 to 6-7 and correlated with several tests of word fluency. The results suggest that word fluency may be a function of temperamental as well as intellectual traits. (*Eugene T. McDonald, Pennsylvania State College.*)

PENFIELD, W. AND RASMUSSEN, T. Vocalization and arrest of speech. *Arch. Neurol. Psychiat.*, 1949, **61**, 21-27.

Electro-stimulation of the human cerebral cortex was used to induce either vocalization or arrest of speech in more than 29 different patients. Vocalization consisted of a clearly-produced vowel sound while arrest of speech was judged from direct interference or the subject's statement that he wanted to talk but could not.

Vocalization and speech arrest are represented bilaterally on the pre- and postcentral gyri within the area devoted to the lips, tongue, and jaw, but with no fixed sequence. In addition to the bilateral representation of the sensorimotor speech areas on brain maps, parietal and frontal extra-Rolandic arrest-of-speech areas are indicated. The frontal area, often identified with Broca, constitutes the frontal operculum, immediately anterior to the inferior gyri of the dominant hemisphere. The area located in the parietal lobe of the dominant hemisphere is anterior to the fissure of Sylvius and posterior to the postcentral gyrus.

The authors consider their observations sufficient evidence for positing the presence of a frontal area and a parietal area in the dominant hemisphere, the functional integrity of which is essential to the mental processes involved in speaking. The authors indicate that the neuronal connections of these second speech areas are not transcortical but rather are mediated via subcortical pathways to the Rolandic convolutions on both sides. (*Charles Elliott, Pennsylvania State College.*)

TEMPLE, F. AND DOLL, E. Organic impairment simulating mental deficiency. *Amer. J. Orthopsychiat.*, 1949, **19**, 112-119.

Sequellae of severe head trauma, chronic intracranial pressure, and chronic anoxia are discussed as some of the organic factors producing atypical developmental retardation that simulates mental deficiency. The authors believe that reported cures of mental deficiency may be due to errors of initial diagnosis and hold that 'true' feeblemindedness is considered incurable. However, the above conditions of organic impairment often are considered to have an optimistic prognosis, especially where therapists in language, social, and medical areas develop collaborative treatment procedures. A case of transcortical aphasia is used for illustration. (*Charles Elliott, Pennsylvania State College.*)

BRIDGES, J. C. A plan for ethics. *Hearing Aid*, 1949, **2**, 14-15.

A letter and proposed code of ethics for hearing aid dealers is reproduced. Emphasis is laid on ethics in advertising, and enforcement machinery utilizing the International Hearing Aid Association is proposed. (*Leo G. Doerfler, University of Pittsburgh.*)

ALAJOUANINE, T. Aphasia and artistic realization. *Brain*, 1948, **71**, 229-241.

Case histories of three kinds of artist (a writer, a musician and a painter) are presented to illustrate what happens to productive literary, musical or pictorial activity after the onset of aphasia. Four implications concerning: (1) the different nature of the psychophysiology in artistic realization in the three artists, (2) the part played by the alteration of technique which remains localized to language, (3) the altered means of expression in the failure of artistic realization as compared with perseveration of conceptual thinking and (4) intellectual interference as far as artistic creation is concerned, are drawn. (*Eugene T. McDonald, Pennsylvania State College.*)

LINDGREN, H. C. General semantics: a tool for the counselor. *Occupations*, 1949, **27**, 229-233.

The counselor, working with clients who

present various vocational problems, will find general semantics a valuable tool. Use of principles of general semantics will enable the counselor to become a more effective agent to help the client use his own resources in achieving adjustment. Understanding of general semantics will make it possible for the counselor to avoid unwarranted generalizations and arbitrary classifications; will assist him in discovering how each client interprets his environment; and will help him to avoid confusing test scores with the level and kind of behavior the score is supposed to symbolize. A brief bibliography is included. (*Charlotte G. Wells, University of Missouri.*)

Review of psychiatric progress 1948. *Amer. J. Psychiat.*, 1949, **105**, 497-547.

Nineteen separate summaries are offered by leaders in various specialties. Among items of particular interest to the speech and hearing clinician might be: W. T. Liberson's note in 'Electroencephalography' that procedures have been developed for pharyngeal and for intra-auricular EEG recordings; S. G. Estes, in 'Psychometrics,' discusses new tests, among which D. J. Van Lennep's 'Four Picture Test' is offered as a new projective procedure of personality study similar to Murray's TAT but requiring less time to administer; Leo Kanner, in 'Child Psychiatry. Mental Deficiency,' takes note of a study refuting the belief that all 'planned and wanted' children are accepted children. A bibliography at the end of each section is keyed to the literature survey made by each author. (*Charles Elliott, Pennsylvania State College.*)

ANDREWS, T. G. Some psychological apparatus: a classified bibliography. *Psychol. Monogr.*, 1948, **62**, No. 2.

A bibliography of 942 items is classified into topics under 13 areas of experimental and clinical usage. The area of audition deals with oscillators, audiometers, tuning forks, koenig cylinders, general apparatus, noise measurement, recording and viewing, tone analysis, sound-proof room, and 'miscellaneous.' Only articles in psychological and physiological journals citing apparatus specifically have been used. References as late as 1948 are noted. (*Charles Elliott, Pennsylvania State College.*)

GOODFRIEND, L. S. Problems in audio engineering. *Audio-Engin.*, 1949, **33**, 23, 34-36.

A prospective audio-engineering course to be serialized is described. Differences in presenting such a course to engineering students and to other interested persons are outlined. A consideration of acoustics and psychology must precede the study of electronics. Subjects to be covered include: hearing, sound waves, architectural acoustics, sound spectra, electronic devices, circuits and components, dynamical analogies, amplifier design, sound transmission systems and design of auditoria and studios. (*Leo G. Doerfler, University of Pittsburgh.*)

LEBEL, C. J. Psycho-acoustic aspects of higher quality reproduction. *Audio-Engin.*, 1949, **33**, 9-11, 32-34.

Listener fatigue is a factor in proper design of radio receivers, hearing aids, recording and motion picture equipment. 'The fatigue effect results after a listening period of a few minutes to a dozen hours. It is a fatigue of the understanding centers of the brain,' and may be evaluated through the use of jury teams. Noise is the worst fatigue factor, ranging from clothing noise in hearing aids to static, record scratch, distortion and band width of reproduction. The dynamic characteristics of loudspeaker, microphone and pickup may also have an effect, and are not always identical with the static characteristic.

Radio sets, broadcast lines and equipment, and recordings should be improved so that the program heard in the home will have a response up to 8,000 or 10,000 cycles. This should not be at the expense of added distortion. Results of two listener tests on detectability of changes in program band width are compared. (*Leo G. Doerfler, University of Pittsburgh.*)

POTTER, R. K. Objectives for sound portrayal. *J. acoust. Soc. Amer.*, 1949, **21**, 1-5.

No single sight-to-sound translator will be suitable for portrayal of all types of sounds because of wide variations in sounds. Problems in the construction of translator systems are discussed with schematic representation of the principles involved in sound portrayal. The aural type of spectograph provides a useful means of investigation of sound, although differing types give somewhat similar results with the added advantage of simplicity, inexpensiveness, and consequent increased availability. (*Leo G. Doerfler, University of Pittsburgh.*)

RAIMY, V. C. Functional specifications for a sound recorder for the psychological clinic. *Amer. Psychologist*, 1948, **3**, 513-518.

A detailed discussion of specifications (costs, operation, performance) is pointed towards 'the practical problems which must be solved by anyone hoping to make inexpensive intelligible recordings in a clinical situation.' Names and addresses of 16 manufacturers of disc, film, tape, and wire re-

corders are listed. A table of analysis of 26 'representative recorders' on 11 criteria is presented. (*Charles Elliott, Pennsylvania State College.*)

GIFFORD, M. F. Speech correction comes of age in California. *West. Speech*, 1949, **13**, 19-23.

This article is one of a series of reports on various speech activities in the western states, providing special information on the historical background of programs in speech correction. The development of speech correction services in the State of California is traced from 1915 to the present. A plan to continue publication of articles tracing the development of speech activities in the West is reported. (*Charlotte G. Wells, University of Missouri.*)

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# News and Announcements

Miriam D. Pauls, Editor*

### Announcements of Graduate Assistantships

In the September issue News and Announcements will introduce a new section devoted to announcements of graduate assistantships in speech and hearing disorders and speech science available at various universities. This section will be restricted to part-time appointments only; it will not include full-time positions, scholarship grants, or tuition scholarships.

Directors of units and heads of departments are invited to submit listings to the News and Announcements Editor. Information should include formal titles of position, institution, and unit; dates, general duties, and remuneration; name and address of person receiving applications. Copy will be accepted at any time, but the deadline for each issue is two and one-half months prior to the publication date. It is expected that this new section will be of greatest usefulness in the December and March issues, for which the deadlines are September 15 and December 15, respectively.

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The Division of Special Education, School of Education, Syracuse University, in cooperation with the New York Association for Crippled Children and the National Society for Crippled Children and Adults, Inc., is offering a workshop on the problems of children and adults with cerebral palsy. The purpose of the workshop is to offer by lecture, group discussion and demonstration recent advances in cerebral palsy to professional workers. Some 20 authorities in various aspects of the field will lecture. Among them are: Winthrop Phelps, M. D.; Edgar Doll, Ph.D.; Mary Huber, Ph.D; William Peacher, M.D.; Jayne Shover, M.A.; Harold Westlake, Ph.D.; Louis Di Carlo, Ed.D.; and Gordon Hoople, M.D. Dr. William Cruickshank is the director. Registration will be limited to 40 persons. The workshop will be held from July 25 to August 12.

In the Conservation of Hearing Center, Syracuse University is offering six courses in clinical and educational audiology. In addition to the courses there will be two demonstration classes, which will be taught by Miss Marion Quick and Miss Marjorie Magner of the Clarke School for the Deaf.

The fourth annual conference on problems of impaired hearing will be held on July 24. William G. Hardy, Ph.D., School of Medicine, Johns Hopkins University and Miss Estelle Samuelson, Executive Secretary, New York League for the Hard of Hearing, will be the speakers.

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Pennsylvania State College is holding its second annual speech symposium June 13-24. There are four guest speakers each of whom will give four lectures. Charles Van Riper, Ph.D., Western Michigan College of Education will discuss stuttering. Grant Fairbanks, Ph.D., University of Illinois, will talk on voice and articulation disorders. Spencer F. Brown, Ph.D., M.D., University of Iowa, will speak on organic speech problems and the cooperative role of the physician. William Blatz, M.D., University of Toronto, will discuss the emotional problems of the child and mental hygiene for handicapped children and their parents. The symposium is part of the Inter-Session and may be taken for credit.

The Inter-Session will feature two programs in addition to the symposium. During the three-week period Dr. Cordelia Brong will teach a course in Speech Disabilities. Professor Margaret Raabe, together with a

Miriam D. Pauls (M.A., Wayne, 1939) is in the School of Speech, Northwestern University.

teacher of the deaf and a nursery school teacher, will conduct a two-week clinic for parents and their pre-school age hearing handicapped children, beginning June 13.

During the six-week summer session, which begins on June 27, a number of courses will be offered in speech correction and hearing theory and practice, as well as related courses that are needed for certification. A residential clinic, to which 40 persons with hearing and speech problems will be admitted, will provide case material.

During the Post-Session (August 8-26) Speech Pathology will be offered.

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As part of the program in Audiology at Northwestern University during the 1949 summer session, Dr. Alexander G. W. Ewing and Mrs. Irene Ewing are offering courses in the education of acoustically handicapped children and conducting demonstration activities. They will teach two nine-week courses bearing credit toward degrees offered by Northwestern. The demonstration activities are composed of daily classes for children with impaired hearing. Children are handled in four groups, ranging from the pre-school age to adolescence. Each group receives integrated instruction in auditory skill, lip reading, speech and language development. The demonstration activities are correlated with the course offerings and other phases of the program in Audiology.

The annual Audiology Symposium will be centered around the Psycho-Educational Evaluation of Hearing Deficiencies. The dates of the Northwestern summer sessions are: Six-weeks session, June 24-August 6; Nine-week session, June 24-August 29.

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The Vassar Summer Institute for 1949 (July 7-August 6) will enroll hard-of-hearing children between the ages of two and 12. These children will live with normally hearing children and will participate in the regular program of the Children's School in addition to their special training in speech-reading and remedial speech.

A seminar for parents and teachers will also be offered, demonstrating ways of meeting the needs of hard-of-hearing children and helping them to good adjustment in the home and at school.

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Dr. Ruth Beckey Irwin will be guest lecturer at Western Reserve University for the summer session beginning June 20. Dr. Irwin will lecture on Clinical Techniques in Speech and Hearing Therapy. She is Supervisor of Speech and Hearing Therapy, Ohio State Department of Education.

Miss Ena Macnutt, Hearing Counsellor of Newton (Mass.) Public Schools and training teacher for the New England School of Lip Reading will be guest lecturer on lip reading for children and adults. Mrs. Gladys Bon Davis, Assistant Professor at Western Reserve and Supervisor of Deaf Classes in Youngstown, Ohio, will give workshops in teaching speech, language and reading to the deaf.

Additional courses in Hearing and Speech by staff members will cover speech correction for the classroom teacher, speech therapy for the orthopedically handicapped, anatomy of the head and neck, pre-school class for the deaf, fitting of hearing aids, and seminars on auditory training and teaching esophageal speech. In the second session, phonetics for speech correction and teaching-the-deaf majors will be given, together with clinical practice in all fields of hearing and speech therapy.

Opportunities for observation and practice will be available in group classes for child, adolescent and adult stutterers, diagnostic and delayed speech children, pre-school deaf, lip reading (children and adults), cleft palate and deaf children.

On March 1, the University of Michigan announced the purchase of Shady Trails, the National Speech Improvement Camp, through a gift of the Kresge Foundation. The camp will continue to operate with Mr. John N. Clancy as Director.

The Speech Clinic of the University of Michigan will operate a summer program for graduate students in speech correction and hearing therapy. The clinical program will include instruction for a group of adolescents, adult aphasics, and hard-of-hearing persons. Dr. Backus, Miss Beasley, Mrs. Sheehan, Mr. Morley, Mr. Garwood and Dr. Schubert will be in residence. Dr. Harlan Bloomer will be in residence at the Shady Trails Camp where he will conduct the seminar, Internship in Speech Correction.

The Clinic has recently reorganized the clinical facilities and staff of the Examining Division. The staff now includes Dr. Dell Henry, Staff Physician; Mr. Victor Garwood, Senior Clinician, with Mr. Don Parker and Mr. Bruce Siegenthaler as graduate assistants; Mrs. Barbara Cook, Social Worker; and Dr. Harlan Bloomer and Mr. John Clancy as Speech Pathologists.

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The University of Utah Speech Clinic has announced an expanded program in speech correction to be conducted during this year's summer term. In addition to the Children's Clinic held regularly in conjunction with the Utah State Crippled Childrens Division, and the clinic for university students, an out-patient clinic for stutterers will be conducted for the first time. A group of adult stutterers will be given an eight-week course of therapy on a full-time basis. Paralleling the clinical work, additional courses will be offered which will cover the etiological and clinical aspects of speech defects.

Two visiting staff members will assist the regular faculty in carrying out this projected program. They are Dr. Ernest H. Henrikson, Associate Professor of Speech and Assistant Director of the University of Minnesota Speech Clinic, and Edward K. Lander, Speech Clinician at the University of Minnesota. Dr. Henrikson will offer courses in organic speech disorders, and speech training for elementary school teachers, as well as conduct a seminar for graduate students. Mr. Lander will have active charge of the out-patient stutterers clinic.

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The Speech and Hearing Clinic at Southwestern Louisiana Institute occupied new quarters in Burke Hall at the beginning of the second semester. The clinic has three rooms equipped for speech therapy and one observation room. All of the clinic rooms are acoustically treated, and one room is especially sound treated for audiometric testing. The Speech and Hearing Clinic is planned to serve a two-fold purpose: To offer speech correction facilities to Southwestern students and children of the surrounding area, and to provide training facilities for Southwestern students interested in continuing work in speech correction.

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A special children's clinic will be operated during the eight-week summer session under the joint auspices of Ohio University and the Ohio Society for Crippled Children, Inc. The clinic is planned to give remedial training to children with speech defects in Athens and the surrounding territory. A fairly intensive type of clinic is planned, with the younger children attending from 9:30 to 12 in the morning and the older group from 1 to 3 in the afternoon. Dr. A. C. LaFollette and Dr. Elizabeth Andersch will be in charge.

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On January 21-22 the Advisory Panel on Psycho-physiology of the Office of Naval Research met at

Central Institute for the Deaf. This group is concerned with research on problems of the special senses. The Conference was devoted principally to hearing. One of the major objectives of the meeting was to expedite progress by the mutual exchange of ideas and suggestions. Investigators from various universities on Office of Naval Research contracts gave progress reports on current research in hearing and auditory communication. Some of the reports dealt with basic questions in anatomy and physiology; others with the psychology of hearing; and others with the design and use of communication equipment. Several members of the Committee on Hearing of the National Research Council, of the Office of Naval Research, as well as workers from several government laboratories attended the meeting as consultants to discuss the reports with the members of the Advisory Panel.

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A national symposium on new trends in counselling and psychotherapy was held at the University of Illinois on February 25 and 26. It was sponsored by the Student Counselling Bureau in cooperation with the Department of Psychology and the Psychological Clinic. Dr. Wendell Johnson, University of Iowa, spoke on the clinical significance of disturbed speech and language functions.

The purpose of the symposium was to present and discuss current trends in counselling and psychotherapy. Notable contributors in the fields presented varying points of view. The symposium was set up so that differences and similarities in theories and practical procedures were pointed up with the object of stimulating discussion and new research approaches.

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Bowling Green State University will open a cerebral palsy center this fall. It will be housed in the Speech Building which is now under construction at the University. The University and the Ohio Society for Crippled Children are co-sponsors of the project. Facilities will be available for speech and hearing therapy, as well as physical and occupational therapy under medical direction. The Ohio Society has allocated $15,000 a year for a three-year period to pay for staff and special equipment. Miss Adeline McClelland, director of the University Hearing and Speech Clinic, will be in charge.

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The American Academy of Cleft Palate Prosthesis met at the College of Dentistry, Ohio State University on March 21 and 22. In addition to sessions devoted to talks given by surgeons, dentists and speech correctionists there were five progressive clinics in which patients were rotated. Each clinic was conducted by an oral surgeon, a prosthedontist, an orthodontist, and a speech correctionist. Among the speakers were: George A. Kelly, Ph.D., Ohio State University; T. M. Graber, D.D.S., Northwestern University; Wayne Slaughter, M.D., University of Illinois; Hugh G. Beatty, M.D., Columbus, Ohio; James Barrett Brown, M.D., St. Louis; Henry M. Moser, Ph.D., Ohio State University; Herbert Koepp Baker, Ph.D., University of Illinois; and Claude E. Kantner, Ph.D., Ohio University.

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The Evanston chapter of Alpha Chi Omega has made a gift to the School of Speech of Northwestern University which enables the Speech Clinic to give greater emphasis to its work with the speech and hearing problems of cerebral palsied children. The funds make it possible to equip a room and support a graduate student. The plan is to concentrate on children of preschool age. To make the training more efficient as well as to help more children, the parents will be trained to do much of the teaching and will report to the speech clinic at regular intervals for instruction and supervision. One of the major purposes of the Cerebral Palsy Speech Center is to develop equipment and techniques for stimulat-

ing speech and language in these children. It is planned to issue appropriate bulletins which will serve as guides to parents of cerebral palsied children.

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Sigma Alpha Eta, a speech and hearing society for students, was founded in 1946 at The Pennsylvania State College under the leadership of Dr. Eugene T. McDonald, director of the clinic. It was designed to provide opportunities for staff members, graduate students, and undergraduate students to exchange ideas, to become better acquainted with one another, and to find ways for stimulating interest in speech and hearing problems. Since its beginning, its members have held regularly-scheduled professional meetings and have enjoyed many companiable hours together. As a special feature they have sponsored social events for the speech and hearing handicapped persons who are under treatment at the clinic, thus giving the patients a chance to use their newly-acquired speech skills in social situations and providing opportunities for the clinicians to observe their cases in non-clinical experiences.

Beta Chapter was installed at Lock Haven State Teachers College in 1948 with Miss Ruth Curtis as Adviser. During the past few months a gratifying number of colleges have applied for additional chapters. Realizing the potentialities of such an organization as an interest-building and unifying force in any speech correction department, the students and advisers of the Alpha and Beta Chapters, together with representatives from other campuses, are now laying the groundwork for an organization which, it is hoped, may become national in its scope.

The structure being developed provides for three levels of membership: Associate Membership, open to all college students interested in speech and hearing work; Full Membership, to include those students specializing in the speech correction curriculum; and Honor Membership granted on the basis of high achievement in scholastic and clinical activities.

For information about the role this society can play in a speech and hearing program write to Dr. C. Cordelia Brong, faculty adviser of Sigma Alpha Eta, Speech and Hearing Clinic, Pennsylvania State College, State College, Pennsylvania. Any suggestions that will help to shape the policies of a speech and hearing organization with a national outlook, will be happily received.

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*Coronet* News Bureau has released a new instructional film entitled *Your Family.* It is one reel, sound, color or black and white. Viola Theman, Ph.D., Northwestern University, collaborated on the film. It is a story of family life aimed at developing an appreciation and understanding of the family as a social unit and the role of the individual in that unit (For Primary children).

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A half-hour program entitled 'The Need for Speech Correction in Our Schools' was presented from The Pennsylvania State College on the evening of January 17, over the local network of WMAJ. The script was written by a committee of students under the supervision of Dr. C. Cordelia Brong, a member of the Speech and Hearing Clinic staff, and presented by the Radio Production classes at the college. A recording was made of the performance, and plans are in progress to make available copies of this program for use by radio stations throughout the state.

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Many books relating to the education of the deaf have been out of print for some time. Theta chapter of Mu Iota Sigma, the national fraternity for teachers of the deaf, has mimeographed *Outline of Language for Deaf Children,* Books One and Two, by Edith Buell. A limited number of copies are available and may be purchased through Miss Marian Quinn, Department of Special Education, University of Illinois, Urbana.

## Personals

The inauguration of Dr. D. W. Morris, President of the American Speech and Hearing Association, as eighth president of Southern Illinois University was held on May 5. A preinaugural reception honoring Dr. and Mrs. Morris was held the previous evening. A luncheon for delegates and an open house at the home of the president followed the inauguration.

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Dr. Clarence Simon will return to the School of Speech, Northwestern University, in time for the summer session. He has been on two-year's leave of absence while teaching at the University of Hawaii.

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Boyd V. Sheets who was granted his Ph.D. in Speech Pathology at the University of Minnesota in December, 1948, is now serving as Assistant Director of the University of Utah Speech Clinic at Salt Lake City.

Dr. Claude E. Kantner, Director of the School of Dramatic Art and Speech of Ohio University, is scheduled to teach courses in speech correction and voice and articulation at the University of Minnesota during the first term of the summer session.

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Dr. Mary Huber spoke in Washington, D.C., on April 13 to the District of Columbia Society for Crippled Children and Adults on the subject of Motivation Techniques in Linguistic Stimulation of Cerebral Palsy Children. Dr. Huber will also lecture for two weeks in June at Southern Methodist University in Dallas, where she will be sponsored by the Texas Society of Crippled Children and Adults, Inc. From Dallas she will go to Stanford University where she will teach for the summer session.

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# NOTICE

### To Applicants for Membership and to Members Desiring Advancement in Membership

In the last issue, attention was called to the revision in committee structure whereby evaluation of applications for membership and for advancement in membership is now performed by the Committee on Credentials, of which the Chairman in Dr. Margaret E. Hall. It was not intended that this announcement imply any change in the *procedure* of applying for membership. As provided by the Constitution, applications should be mailed initially to the Secretary-Treasurer of the Association, Dr. George A. Kopp, Speech Clinic, Wayne University, Detroit, Michigan.